SECTION 3

Affected Environment and Environmental Consequences

This section describes critical environmental elements that may be affected by the Proposed Action and the environmental consequences. Each critical environmental element provides the impact conclusions of the primary issues such as public safety, water resources, and threatened and endangered species.

The following critical elements of the environment were considered but are not addressed since they are not present or not affected in any way: Areas of Critical Environmental Concern, Prime or Unique Farmlands, Wild and Scenic Rivers, and Wilderness.

3.1 General Setting

The proposed project spans portions of three states, four counties, and two North American deserts. Elevations across the project range from 4,000 feet to approximately 1,000 feet above sea level. Extreme temperature changes are common throughout these desert regions. Average annual temperatures range from 63.2°F in the El Paso region to 68.4°F in the Tucson region.

3.1.1 Segment A

Segment A traverses an eastern portion of the City of El Paso, the El Paso International Airport, and Fort Bliss Military Reservation east of the Franklin Mountains in northeast El Paso. The segment, totaling 12 miles, would tie into the newly constructed breakout facility just west of Railroad Drive. Segment A would generally follow SFPP's existing pipeline ROW. The proposed ROW from the airport to the breakout facility is dominated by mesquite desert on sandy soils. The vegetation is common to the Chihuahuan desert region.

3.1.2 Segment B

Segment B originates at the El Paso breakout facility and continues west over the Franklin Mountains along State Highway 404 for a total of 31.8 miles. The pipeline crosses the Rio Grande north of Anthony, New Mexico and terminates at the Afton Scraper station. Segment B traverses agricultural areas such as pecan orchards and variations of plant communities common to the Chihuahuan desert.

3.1.3 Segment C

Segment C originates in the Apache Pass region of southeast Arizona in Cochise County. The proposed route passes south of Wilcox to Benson, Arizona. The pipeline would cross the San Pedro River just north of Benson and continue west along Interstate 10 to the Tucson terminal. This approximately 97-mile segment contains both Sonoran desert plant communities and agricultural land.

3.1.4 Ancillary Facilities

As described in Section 2.1.2, ancillary facilities to be constructed or modified include upgrades to the breakout facility in El Paso County (Segment A), three existing pump stations, two existing terminals, new and existing valves as needed, cathodic protection test stations, and pipeline markers. The general settings of the ancillary facilities are similar to the descriptions provided above, mainly predisturbed vacant Chihuahuan or Sonoran Desert environment.

3.2 Land Use

The SFPP pipeline crosses both federal and non-federal jurisdictions. Since the route of the three proposed segments are dictated largely by the location of the existing pipeline, most of the lands crossed are within predisturbed railroad, pipeline, and fiber-optics ROWs. Where the pipeline crosses cities, such as EL Paso, Texas, and Tucson, Arizona, there are more commercial, industrial, and residential developments. Grazing areas also are found along the segments; however, none are predicted to be disturbed at the moment. If fences, gates, and/or water tanks disturbances occur on grazing land, the owner will be notified and any disturbance will be mitigated by returning the adjustments to their original condition and location as possible.

Figure 3.2-1 presents the surface land ownership for the three proposed segments, and Table 3.2-1 presents land ownership disturbance by segment.

3.2.1 Affected Environment

3.2.1.1 Segment A

Segment A is 12 miles in length and 145.5 acres in area, including the temporary 100-foot construction easement. All of Segment A is located in El Paso County. Land ownership includes the City of El Paso, El Paso County, Department of the Army, and Union Pacific Railroad, and private commercial properties.

3.2.1.2 Segment B

Segment B is 32 miles in length and 385 acres in area, including the temporary 100-foot construction easement. Segment B is located in El Paso County, Texas and Dona Ana County, New Mexico. Land ownership includes El Paso Natural Gas, the City of El Paso, BLM, and private properties. The private lands are mostly used for agricultural purposes.

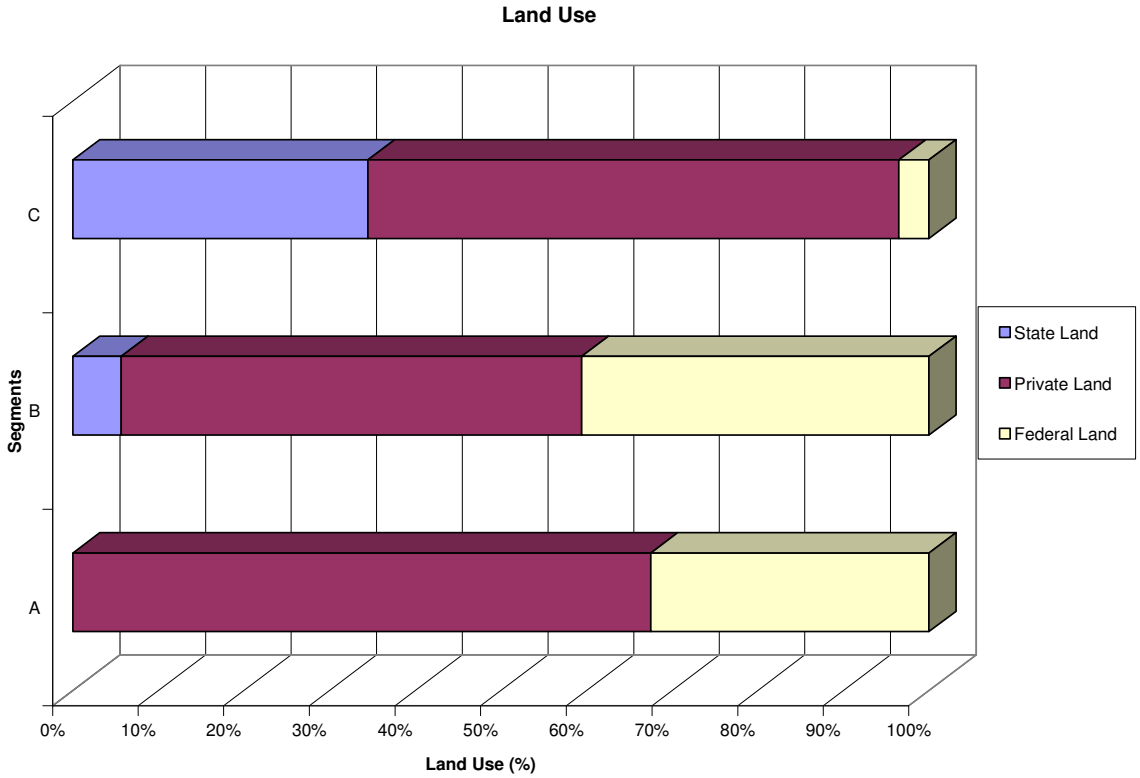

Figure 3.2-1. Land Use Ownership by Segment (percentage of ownership).

Table 3.2-1. Land Use Ownership by Segment.

		Segments			
		A	**B**	**C**	**Total by Land Use**
State Land	Miles	0	1.8	33.4	**35.2**
	Acres	0	21.8	404.8	**426.6**
Private Land	Miles	8.1	17.1	60.1	**85.3**
	Acres	98.2	207.3	728.5	**1034**
Federal Land	Miles	3.9	12.9	3.4	**20.2**
	Acres	47.3	156.4	41.2	**244.9**
Total Miles		**12**	**31.8**	**96.9**	
Total Acres		**145.5**	**385.5**	**1174.5**	

3.2.1.3 Segment C

Segment C is 97 miles in length and 1,174 acres in area, including the temporary 100-foot construction easement. Segment C is located in Cochise and Pima counties. The majority of land ownership is private and Arizona state lands. The small portion of federal land is BLM and National Park Service ownership. The private lands are used for grazing or were previously used for grazing and agriculture.

3.2.1.4 Ancillary Facilities

Ancillary facilities such as the El Paso Breakout facility and existing pump stations and terminals will undergo upgrades. Land use at these facilities will remain the same.

3.2.2 Environmental Consequences

3.2.2.1 Proposed Action

Landowners would be notified in advance of any construction or survey activities that might interfere with their operations and privacy. For the most part, this project is located within an existing utility corridor on both public and private land; therefore, no significant impacts are expected in the long term. Temporary short-term impacts during construction may include inconveniencing private landowners during surveys and construction activities to gain access to their lands. Provisions will be made to accommodate concerns expressed by any of the land owners.

3.2.2.2 No Action Alternative

Under the No Action Alternative, no pipeline expansion would occur and land use regulations along each segment would remain unchanged. Land use would not be affected by implementation of the No Action Alternative. No mitigation would be required.

3.3 Recreational Resources

3.3.1 Affected Environment

Recreational activities include hunting, camping, picnicking, nature studying and observation, wildlife and cultural viewing, hiking, photography, back-country vehicle use, off-roading, and sightseeing, among others.

Impacts on recreational resources would occur if the construction, operation, and/or the existence of the pipeline resulted in the degradation or termination of the recreational activities in any specific area.

3.3.1.1 Segment A

No specific recreational resources were found in Segment A. General recreational resources in the area include nature, wildlife, and cultural observation. No hunting is allowed within city limits. Photography and off-roading are not typical in that area of El Paso or on Fort Bliss.

3.3.1.2 Segment B

Segment B contains BLM recreation land of the Organ and Franklin Mountains Area of Critical Environmental Concern (OFMACEC). The proposed route crosses 5.5 miles of the ACEC from approximately MP 23 to MP 28.5. At approximately MP 27.1, the proposed route crosses the Sierra Vista Trail. The ACEC provides recreational opportunities for hiking, mountain biking, horseback riding, off-highway driving, hunting, photography, and nature and wildlife observation. Throughout the other BLM land within Segment B, the same type of recreation activities occur in a more dispersed manner.

3.3.1.3 Segment C

Segment C contains recreational lands of Fort Bowie National Historic Site and Cienega Creek Nature Preserve. The proposed route crosses a small portion of the western corner of Fort Bowie land. The proposed route would follow the existing ROW through this area. Both Fort Bowie and Cienega Creek provide recreational opportunities for hiking, wildlife viewing, and cultural observation. General recreational resources throughout other areas of Segment C include nature, wildlife, and cultural observation; hiking, hunting; photography; and off-roading.

3.3.1.4 Ancillary Facilities

No specific recreational resources were found where ancillary facilities exist or are proposed. Most of these locations are currently occupied with pipeline or other energy source facilities.

3.3.2 Environmental Consequences

3.3.2.1 Proposed Action

Any potential impacts to recreational resources would be minimal and temporary. Impacts to the use of the OFMACEC as well as the Sierra Vista Trail in Segment B would be temporary and confined to the period of construction activity. The trail would easily be returned to its original condition after construction. The proposed route through Fort Bowie NHS is not located near any designated trails or areas designated for recreational activities. Where the proposed route crosses Davidson Canyon within Pima County's Cienega Creek Nature Preserve one trail is crossed. Impact to use of this trail would be confined to the period of construction activity and the trail would easily be returned to its original condition after construction. Construction activity would present minimal and temporary impacts in the form of temporary delays in traffic to recreational resources.

3.3.2.2 No Action Alternative

Under the No Action Alternative, no pipeline expansion would occur and recreational resources along each segment would remain unchanged. However, the shortage of petroleum products in the Tucson/Phoenix markets may increase fuel prices due to high demand. This might discourage lower income populations from taking recreational trips requiring car travel into recreational areas. No mitigation would be required.

3.4 Geology and Soils

3.4.1 Affected Environment

3.4.1.1 Segment A

The topography along Segment A is relatively flat with occasional gentle slopes. Segment A generally follows an existing pipeline alignment, and the topography does not pose any unusual hazard. The two alternative routes near the Airport diverge from existing pipeline alignments, but pass through similar terrain and geology.

Geologically, Segment A traverses unconsolidated alluvial deposits of the Rio Grande system. Alluvial deposits are typically easy to excavate and do not pose a significant hazard to pipeline installations.

Segment A is within an area of moderately low seismic activity, with a 10 percent chance of experiencing an earthquake with an acceleration of 5 to 6 percent within the next 50 years. Standard earthquake protection measures would be appropriate for Segment A.

Soil types in this region are thermic argic petrocalcids, with mean annual soil temperatures of 18°C. Most soils are deep, moderately coarse and coarse textured, derived from acidic igneous rocks. Two common soil associations found in the area are the Hueco-Wink Association (fine sandy loam, moderately deep) and the Turney-Berino Association (clay loam, somewhat deep). In some areas there may be shrink/swell potential that could affect the pipeline. Soils with this potential generally swell as they become saturated and shrink as they release water. This alternating sequence of shrinking and swelling can result in locally unstable soils.

One potential constraint on installation of the pipeline is the presence of caliche in the El Paso area. Caliche is a discontinuous calcareous deposit normally beginning at an approximate depth of 30 inches below ground surface. Some caliche-lithified areas consist only of friable carbonate cement in soil at the depth of a historical water table. Other caliche-lithified areas can be several feet of well-indurated deposits that are harder than concrete.

There are no apparent obstacles with respect to topography, geology, seismicity, or soil type in Segment A. However, swelling soil contraction and expansion may need to be considered.

3.4.1.2 Segment B

The topography along the proposed route for Segment B is generally flat with occasional gentle slopes. Greater topographic relief is encountered near the Franklin Mountains and west of the Rio Grande River. Segment B follows an existing pipeline alignment, and the topography does not pose any unusual hazard. This Segment crosses the Rio Grande River adjacent to an existing pipeline bridge.

Geologically, Segment B passes through unconsolidated alluvial or playa deposits in Texas and to the east of Anthony's Gap. Alluvial and playa deposits are typically easy to excavate and do not pose a significant hazard to pipeline installations. The segment follows the existing pipeline route into New Mexico and through Anthony's Gap in the Franklin

Mountains, where it encounters various rock types ranging from granite and volcanics to sedimentary (limestones and conglomerates). As mentioned, this segment follows the exiting route. When excavation is required, this area would present difficulties as it is underlain by consolidated rock. West of Anthony's Gap Segment B passes into the alluvial sediments associated with the Rio Grande River. These alluvial deposits (sometimes eolian deposits as well) are typically easy to excavate and do not pose a significant hazard to pipeline installation. In some areas there may be shrink/swell potential that may pose engineering challenges, particularly near the Rio Grande River.

Segment B is within an area of low seismic activity. The entire area has a 10 percent chance of experiencing an earthquake with an acceleration of 4 to 6 percent within the next 50 years. Standard earthquake protection measures would be appropriate for Segment B.

Soil types in this region vary from thermic petrocalcids in the east to thermic Typic Torripsamments in the west, with mean annual soil temperatures of 18 °C. The soils change along this segment, with typical soils ranging from Hueco-Wink Association (fine sand loam) in the east to Bluepoint series (deep loamy sands) in the vicinity of the river to Wink-Pintura Association (deep wind blown sands) in the west.

One potential constraint on installation of the pipeline is the presence of caliche across southern New Mexico. Some caliche-lithified areas consist only of friable carbonate cement in soil at the depth of a historical water table. Other caliche-lithified areas can be several feet of well-indurated deposits that are harder than concrete.

Additional constraints along Segment B may include lateral spreading hazards. Possible lateral spreading hazards occur at locations where the alignment extends across or near the margins of a channel, river, or other body of water with the potential for erosion and/or sloughing of saturated sediments along an embankment. Appropriate design approaches can mitigate the lateral spread hazard.

There are no apparent obstacles with respect to topography, geology, seismicity, or soil type in Segment B. However, the potential for lateral spreading near river crossings (in particular the Rio Grande River area) and swelling soil contraction/expansion may need to be considered.

3.4.1.3 Segment C

Segment C traverses relatively flat topography, although greater topographic relief is encountered near the Chiricahua Mountains west of the Arizona-New Mexico border, and to the east and west of the town of Benson, Arizona. Geologically, Segment C passes through unconsolidated alluvial deposits and playa deposits that are easily excavated. This Segment crosses the San Pedro River near Benson, Arizona.

Segment C appears to be within a low to moderately low seismically active area. The entire area has a 10 percent chance of experiencing an earthquake with an acceleration of 4 percent within the next 50 years.

A large portion of Cochise County, which is found along the eastern portion of Segment C, has very little available soil information. Soil types in this region are mostly hyperthermic arid, with mean annual soil temperatures exceeding 22°C. Most soils along the proposed route are deep and moderately coarse grained. On terraces and alluvial fans, soils are

gravelly. Examples of soil occurrences found along Segment C are the Tombstone series (very deep, excessively drained, very gravelly fine grained sandy loam) and Caralampi series (very deep, well drained gravelly sandy loam) Soils along this corridor could have a shrink/swell potential that could affect the pipeline. Less prevalent than in previous segments, but still common in occurrence is the presence of caliche. Some caliche-lithified areas consist only of friable carbonate cement in soil at the depth of a historical water table. Other caliche-lithified areas can be several feet of well-indurated deposits that are harder than concrete.

Additional constraints along Segment C may include lateral spreading hazards. Segment C crosses a large number of ephemeral washes that are normally dry, but which are subject to flash flooding conditions. Possible lateral spreading hazards occur at locations where the alignment extends across or near the margins of a channel, river, or other body of water with the potential for erosion and/or sloughing of saturated sediments along an embankment. Appropriate design approaches can mitigate the lateral spread hazard.

Lateral spreading and subsidence with resultant earth fissures present possible hazards in Segment C. Slow, large-scale subsidence due to the overpumping of regional groundwater is occurring in several portions of Arizona. Segment C passes through such areas near Bowie, Willcox, and southeastern Tucson.

There are no apparent obstacles with respect to topography, geology, seismicity, or soil type identified in Segment 3. However, subsidence and soil contraction/expansion may present engineering challenges.

3.4.2 Environmental Consequences

3.4.2.1 Proposed Action

Implementation of the Proposed Action would result in short-term impacts to geology and soil as result of construction activities. After pipe installation is complete, the ROW would be recontoured to the original topography with the original soil that was excavated. Caliche or large rock material would be spread across the ROW or disposed of according to appropriate guidelines and landowner approval. No significant long-term impacts are expected. Erosion measures would be in place to help maintain ROW topography. Additionally, the proposed project area would follow alongside existing linear ROWs that have been disturbed in the past and may undergo continual disturbance.

3.4.2.2 No Action Alternative

Under the No Action Alternative, no pipeline expansion would occur and no ground-disturbing activities would take place. Geology and soils within the proposed project area would remain unchanged, and therefore, would not be affected. No mitigation would be required.

3.5 Paleontological Resources

Paleontological resources are non-renewable resources protected under federal law, most notably by the 1906 Federal Antiquities Act. These statutes do not extend to privately held lands, but they do apply to lands managed by federal agencies and to other lands where

paleontological resources may be affected by a federal undertaking as provided for by NEPA. Professional standards for assessment and mitigation of adverse impacts on paleontological resources have been established by the Society of Vertebrate Paleontology (SVP, 1991, 1995, 1996).

3.5.1 Affected Environment

Physiographically, the project area is located in the southeastern portion of the Basin and Range Province (Fenneman, 1931; Morrison, 1991). The southeastern Basin and Range lies south and southeast of the Colorado Plateaus and, as elsewhere in the physiographic province, is typified by north-south trending mountain ranges separated by broad valleys filled with alluvium eroded from those mountains, as well as sediments from more distant sources in the case of the basins hosting the Rio Grande. The valleys may be either internally drained with no outlet, such as the Sulfur Springs Valley in southeastern Arizona crossed by part of Segment C. Other valleys that once were internally drained but that are now part of much larger river systems include the Mesilla Basin, crossed by Segment B and drained by the Rio Grande, and the San Pedro Valley, drained by the river of that name and crossed by Segment C. These valleys have been the locus for the deposition of fine-grained sediments for millions of years, and these sediments have yielded scientifically significant vertebrate paleontological specimens of both Pleistocene and late Tertiary age, generally where erosion and/or uplift have left them exposed.

Some of the intervening mountains crossed by the pipeline ROW are composed of fossiliferous sedimentary rock. Generally speaking, however, most fossils from these rocks are of Paleozoic invertebrates and are accorded a lower level of significance than Tertiary and Pleistocene vertebrate remains.

3.5.2.1 Paleontological Sensitivity Along the ROW

Paleontological sensitivity is a qualitative evaluation applied to a geological unit that combines two factors: (1) the probability that fossils will be encountered in that unit given the depth of disturbance, and (2) the likelihood that those fossils will be scientifically significant in and of themselves. It is the professional judgment of a paleontologist based on available information that includes the geology of the area potentially impacted by the project, past fossil finds in the area, and the geomorphic regime (whether or not an area is or has been conducive to fossil preservation due to its physical setting). Table 3.5-1 presents a summary of paleontological sensitivity along the pipeline ROW based on these factors and given the available information.

Table 3.5-1

Paleontologically Sensitive Sediments Identified Along the EPX Pipeline Right-of-Way

PALEONTOLOGICAL SENSITIVITY	M.P. interval (apprx.)	REMARKS
SEGMENT A		
Low	0 -1.0	Quaternary alluvium of the Rio Grande valley border; disturbed soils within industrial area
Low	1 – 2.5	Disturbed and pedogenically altered soils overlying sediments of the fossiliferous Camp Rice formation (QT_{cr}; Collins and Raney, 2000) as well as older alluvium at depth.
Low	2.5 - 4.4	Quaternary eolian and alluvial deposits of the Hueco Bolson; at shallow depth, disturbed soils within residential area
Moderate	4.4 - 5.0	Depositional basin; potential playa sediments beneath eolian sediments, below 3,940 feet asl
Low	5.0 - 11.9	Quaternary eolian and alluvial deposits of the Hueco Bolson
Moderate	11.9 - 13.4	Depositional basin; potential playa sediments below middle Holocene hiatus below 3,960 feet asl
Low	13.4 - 15.3	Quaternary eolian and alluvial deposits of the Hueco Bolson
SEGMENT B		
Low	15.3 - 21.2	Quaternary eolian and alluvial deposits of the Hueco Bolson grading into alluvium of the Franklin Mountains
Moderate	21.2 – 21.9	Alluvium of the Franklin Mountains potentially overlying fossiliferous QT_{cr} sediments. Known fossil sites in the vicinity.
Moderate in sedimentary suites; none in igneous rock	21.9 - 22.3	Paleozoic sedimentary and core complex rock of the Franklin Mountains
Moderate	22.3 - 26.4	Alluvium and older fanglomerate of the Franklin Mountains potentially overlying fossiliferous QT_{cr} sediments
Moderate in sedimentary suites; none in igneous rock	26.4 - 27.8	Mesozoic and Paleozoic sedimentary rock of the Franklin Mountains, and core complex rocks.
Moderate	27.8 - 32.6	Interbedded alluvium of the Franklin Mountains, older alluvium of the Rio Grande valley margin, and the fossiliferous Camp Rice formation (QT_{cr}).
Low	32.6 -38.4	Holocene floodplain of the Rio Grande
High	38.4 -41.6	Undifferentiated valley fill and fluvial sediments of the Rio Grande, and the fossiliferous QT_{cr} exposed on the eastern margin of La Mesa. Known fossil sites in the vicinity.
Low	41.6 -46.9	Surficial eolian sediments overlying pedogenically altered valley fill
SEGMENT C* (begins at MP 207.8)		
Moderate	208.5 - 210	Low in altered Proterozoic rocks; moderate in fossiliferous Paleozoic and Mesozoic strata. Distinctly stratified bedrock, rotated ~ 90 degrees from the horizontal exposed in the vicinity of the ridgeline, Goodwin Canyon area
Moderate	228.5 - 232.5	Southeastern littoral zone of Pluvial Lake Cochise; below the maximum glacial-age highstand of ~4,200 feet elevation.
Low	232.5 - 234.8	Oxidized playa sediments overlying deep-water facies of Pluvial Lake Cochise

PALEONTOLOGICAL SENSITIVITY	M.P. interval (apprx.)	REMARKS
High	234.8 - 236.7	Southwestern littoral zone of Pluvial Lake Cochise; below the maximum highstand of ~4,200 feet elevation. Known fossil sites in the vicinity.
Moderate	246.2 – 249.0	Fine-grained Quaternary alluvium of the Dragoon Wash floodplain
High	255.7 - 256.9	Outcrops of the Saint David Formation on the east side of the valley; fine-grained fossiliferous Plio-Pleistocene valley fill. Known fossil sites in the vicinity.
Moderate	256.9 - 260.5	Fluvial facies of the San Pedro River and/or marsh sediments likely present at depth.
Low	260.3 - 263	Holocene floodplain of the San Pedro River
Moderate	263 - 264.5	Fluvial facies of the San Pedro River likely present at depth; these may be fossiliferous.
High	264.5 - 265.2	Outcrops of the Saint David Formation on the west side of the valley; fine-grained fossiliferous Plio-Pleistocene valley fill. Known fossil sites in the vicinity.
Moderate	276.4 - 280.3	Floodplain of Cienega Creek and lower Mescal Arroyo.

* Intervals with low or no paleontological sensitivity in upland areas are not listed to conserve space
apprx. - approximate

Segment A

This segment lies on the western edge of the Hueco Basin of west Texas, and on the eastern bajada of the Franklin Mountains. Two areas of moderate paleontological sensitivity are found within relatively small, closed depressions that may harbor playa soils and paludal sediments at depth (Table 3.5-1). These depressions are common farther in western Texas, and some have yielded well-preserved fossils of Late Pleistocene vertebrates (Holliday, 1997).

Segment B

This segment begins on the eastern bajada of the Franklin Mountains before crossing the mountains and then extending down the western bajada of the Franklin Mountains and, finally, up the eastern edge of the broad, flat surface west of the Rio Grande appropriately named La Mesa. Two areas of moderate sensitivity are located where the ROW crosses the fossiliferous Paleozoic limestone of the Franklin Mountain. A third area of moderate sensitivity is designated along the dissected edge of La Mesa, where erosion has exposed a substantial thickness of valley-fill sediments that likely include fine-grained fossiliferous deposits.

Segment C

This segment begins in extreme southeastern Arizona and extends west and northwest to Tucson, and is much larger than the previous two segments. Sensitive areas include one crossing of fossiliferous limestone in the uplands, and the crossings of two valley bottom settings of known paleontological sensitivity. The first is the Wilcox Playa area, which has been known to yield the remains of extinct Pleistocene vertebrates since the 19th Century (Waters, 1989). The second is the San Pedro River Valley where erosion has exposed

lacustrine and wetland sediments of the Plio-Pleistocene St. David Formation. The St. David Formation has yielded a range of fossils important in understanding the biostratigraphy and ecological history of the American West (e.g., Morgan and White, 2005). In addition, crossings of the San Pedro River as well as Cienega Creek impact fluvial sediments that may contain paleontological resources at depth.

3.5.3 Environmental Consequences

3.5.3.1 Proposed Action

Excavations in sediments that posses moderate to high paleontological sensitivity are anticipated to impact non-renewable paleontological resources that would be important to scientific research, and would therefore be a significant impact if not mitigated.

A pre-construction field reconnaissance by a qualified paleontologist would be done in areas where paleontologically sensitive sediments (moderate or high sensitivity) have been identified as occurring at or near the surface. The results of the reconnaissance may lead to some downgrading or upgrading of the sensitivity of designated paleontologically sensitive areas (Table 3.5-1).

A Paleontological Resources Monitoring and Mitigation Plan (PRMMP) would be included in the Plan of Development. The plan will address those activities necessary to mitigate impacts to paleontological resources, as typically undertaken by professional paleontologists, and are consistent with SVP standard guidelines for mitigating adverse construction-related impacts on paleontological resources (SVP, 1995; 1996).

Implementation of these measures will reduce potentially significant adverse environmental impact of project-related ground disturbance and earth moving on paleontological resources to an insignificant level by allowing for the recovery of fossil remains and associated specimen data and corresponding geologic and geographic site data that otherwise would be lost to earth moving and to unauthorized fossil collecting. Reconnaissance of the area of potential effect for paleontological resources, followed by the development and construction phase implementation of the project-specific mitigation plan, will reduce impacts to paleontological resources to a level that will be less than significant.

Because no excavations are expected from pipeline operation, no operational phase impacts to paleontological resources are expected.

3.5.3.2 No Action Alternative

Under the No Action Alternative, no pipeline expansion would occur and no ground-disturbing activities would take place. Paleontological resources within the proposed project area would remain unchanged, and therefore, would not be affected. No mitigation would be required.

3.6 Hydrology and Water Quality

3.6.1 Affected Environment

3.6.1.1 Segment A

Groundwater in Segment A is located in the Hueco Bolson aquifer, part of the Rio Grande Basin area. The alluvial deposits are composed of gravel, sand, silt, and clay. Groundwater is typically at a depth greater than 100 feet belowground surface (bgs). There do not appear to be any hydrogeologic features that preclude constructing a pipeline along this segment of the alignment.

Potentially high in total dissolved solids (TDS), the water type varies by location from sodium bicarbonate to calcium-sodium sulfate. While waters may be corrosive in some areas, overall water quality, coupled with the probable depth of groundwater, does not pose a problem for the construction and maintenance of the pipeline.

3.6.1.2 Segment B

Groundwater in Segment B is also in the alluvium of the Rio Grande system. The alluvial deposits are composed of gravel, sand, silt, and clay. Groundwater is typically at a depth greater than 100 feet bgs, but may approach the ground surface in some areas in larger towns and cities and near river crossings. Local dewatering of an excavation may be necessary in these areas. There do not appear to be any hydrogeologic features that preclude constructing a pipeline along this segment of the alignment.

The water quality of the shallow aquifer is similar to that of Segment A. While waters may be corrosive in some areas, overall water quality, coupled with the probable depth of groundwater, does not pose a problem for the construction and maintenance of the pipeline.

3.6.1.3 Segment C

Groundwater in Segment C is located entirely within the Basin and Range system. The alluvial deposits are composed of gravel, sand, silt, and clay. Groundwater is typically at a depth greater than 100 feet bgs, but may be near the ground surface in some areas such as larger wash and river crossings and near towns such as Benson. Local dewatering of an excavation may be necessary in these areas. There do not appear to be any hydrogeologic features that preclude constructing a pipeline along this segment of the alignment.

The water quality of the shallow aquifer is generally suitable for most uses. TDS is normally less than 1,000 parts per million (ppm) as the alluvium is regularly flushed with recharge. Water types are commonly calcium-magnesium sulfate-bicarbonate with the exception of the local surficial groundwater systems related to the playa lakebeds (sodium chloride water types). While waters may be corrosive in some areas, overall water quality, coupled with the probable depth of groundwater, does not pose a problem for the construction and maintenance of the pipeline.

3.6.2 Environmental Consequences

3.6.2.1 Proposed Action

Implementation of the Proposed Action may result in the short-term impact of local hydrology or water quality in the event that groundwater is encountered during excavation and dewatering is necessary. However, this potential impact would only occur during pipe installation and would be temporary. No long-term impacts to hydrology or water quality are expected. Additionally, the proposed project area would follow alongside existing linear ROWs that have experienced past pipeline installations with no long-term impacts to hydrology or water quality.

After pipeline installation, the pipe would be hydrotested. Hydrotest discharge permits would be obtained from TCEQ, EPA, and ADEQ. Waters from the hydrotests would be discharged according the guidelines and best management practices stated in the permit for each region. Water would not be discharged into Waters of the U.S. and water quality would not be impacted.

3.6.2.2 No Action Alternative

Under the No Action Alternative, no pipeline expansion would occur and no excavation of the ROW would take place. Hydrology and water quality within the proposed project area would remain unchanged, and therefore, would not be affected. No mitigation would be required.

3.7 Floodplains and Wetlands

3.7.1 Affected Environment

3.7.1.1 Segment A

Segment A is comprised of mesquite desert and disturbed land through the City of El Paso. The mesquite desert landscape portion is dominated by sand dunes with mesquite (*Prosopis* spp.) hummocks. Salt bush (*Atriplex canescens*), snakeweed (*Gutierrezia sarothrae*), and yuccas (*Yucca* spp.) are scattered throughout the area as well. No wetland features or waters of the United States were identified in this segment.

3.7.1.2 Segment B

Chihuahuan desertscrub is the dominant habitat type within Segment B, making up approximately 16.0 miles followed by agricultural land (approximately 8.8 miles). Semi-desert grassland (approximately 2.5 miles), mesquite desert (approximately 2.3 miles), disturbed land (approximately 2.0 miles), and riparian vegetation at the Rio Grande crossing (approximately 0.2 mile) account for the remainder of the habitat types.

Segment B is entirely within the El Paso-Las Cruces Hydrologic Unit (HU) crossing the Rio Grande and East and West Side Canals. Flow of the Rio Grande north of El Paso is largely controlled by Caballo Reservoir located south of Elephant Butte Reservoir. A large portion of the water is used for agricultural purposed in this area.

3.7.1.3 Segment C

The majority of Segment C comprised of semi-desert grassland (64.0 miles) interspersed with patches of Chihuahuan desertscrub (3.0 miles). Approximately 18.0 miles of Sonoran desertscrub is crossed in the western portion of Segment C. The remainder is oak woodland/semi-desert grassland (3.1 miles), agricultural land (6.1 miles), salt playa (2.1 miles), and riparian (0.3 miles).

Segment C starts within the San Simon Creek HU which is within the Upper Gila River watershed. After Apache Pass the alignment enters the Willow Playa HU crossing numbers unnamed washes terminating in the playa. As the alignment traverses the north end of the Dragoon Mountains it enters the Upper San Pedro Creek HU. Here there are numerous wash crossings associated with Dragoon Wash. The San Pedro River itself would be crossed using a HDD method and therefore not disturbed. West of the San Pedro River crossing the alignment enters the Pantano Wash HU and crosses Cienega Creek, a major tributary of Pantano Wash. Also crossed are Mescal Arroyo and Davidson Canyon, both tributaries of Cienega Creek. Cienega Creek would be crossed using a HDD method and therefore not disturbed. The western portion of Segment C is located in the Upper Santa Cruz HU which is a sub- basin of the Gila River Watershed.

3.7.1.5 Ancillary Facilities

The general settings of the ancillary facilities are similar to the descriptions provided above, mainly previously disturbed vacant Chihuahuan or Sonoran Desert environment.

3.7.2 Environmental Consequences

3.7.2.1 Proposed Action

A brief description of the major features identified within each segment is provided below. Consultation is ongoing with the Army Corps of Engineers and Environmental Protection Agency in obtaining a Nation Wide Permit and would be completed prior to issuance of the Notice to Proceed and ROW grant. Appendix E provides a summary of all the sample locations and features identified in the environmental study area within the 200-foot study corridor.

Segment A. No wetland features or waters of the United States were identified in this segment; therefore, no impacts would occur with implementation of the proposed project.

Segment B. Under the Proposed Action, all ephemeral drainage channels within the temporary construction ROW in Segment B would be disturbed for underground placement of the pipe, including the Rio Grande River. Areas within the ROW would be recontoured to original grade following construction activities. Therefore, the Proposed Action would not affect the function of any of the waterways within Segment B.

Segment C. Under the Proposed Action, all ephemeral drainage channels within the temporary construction ROW in Segment C would be disturbed for underground placement of the pipe. However, San Pedro River and Cienega Creek would be crossed using a HDD method and therefore not disturbed. Excess material from boring would be disposed of offsite. Construction activities would be conducted while there is no flowing water or less than 6 inches of water in the channel. Areas within the ROW would be recontoured to

original grade following construction activities. Excess material from boring would be disposed of offsite. Therefore, the Proposed Action would not affect the function of any of the waterways within Segment C.

No ground water would be pumped out of the bore hole as a result of horizontal directional drilling (HDD) at the San Pedro River or Cienega Creek. HDD refers to a steerable method of installing the pipe in a shallow arc underneath an obstacle. HDD uses a drilling machine to drill under an obstacle. An initial pilot hole is drilled using special drill pipe and enlarged by subsequent passes. The carrier pipe is installed into the completed drill hole by pulling the completely assembled carrier pipe using the drill rig and drill pipe. Unlike a conventional bore, a HDD uses drilling mud to provide integrity to the completed hole and lubrication while the carrier pipe is pulled into the hole. Water is imported from off-site to produce the mud. Surface disturbance is minimal and limited only to the entry and exit hole and the working space required to layout the equipment and string the pipe. A typical drill entry/exit hole will be limited to a small area (5 ft by 5 ft). A typical work space for equipment layout is 100 ft x 150 ft. Additional space is required to layout and assemble the pipe string.

Equipment required for a HDD is the drill rig itself, mud separators, a small crane to handle drill string, boom trucks to assemble and position the carrier pipe for installation, welding trucks to assemble the pipe, vacuum trucks and pumps to control and circulate drilling fluid.

Excess material generated during the drilling process consists of the material removed from the bore hole during the pilot drill, enlarging process and installation process. The spoils are removed and circulated within the drilling mud. The spoil and drill mud are separated to allow reuse of the drilling mud and excess material would be disposed of offsite.

Ancillary Facilities. No wetland features or waters of the United States were identified at the site proposed for ancillary facilities; therefore, no impacts would occur with implementation of the proposed project.

3.7.2.2 No Action Alternative

Under the No Action Alternative, no pipeline expansion would occur and no ground-disturbing activities would take place. Wetlands or waters of the United States within the proposed project area would remain unchanged, and therefore, would not be affected. No mitigation would be required.

3.8 Biological Resources

Information sources for biological resources included field surveys, reference books, journal articles, websites, government databases, topographic maps, aerial photography, review of other projects in the vicinity of the proposed pipeline, and personal communications with agency personnel. As it pertains to biological resources, the 'project area' is defined as 100 feet on either side of the proposed centerline or periphery of proposed facilities. This section addresses vegetation, wildlife, and wildlife habitat. Special status species of plant and wildlife are treated separately in Section 3.8.

Reconnaissance surveys conducted from November 2005 through April 2006 characterized the vegetation and wildlife habitat within the project area. Surveyors employed a combination of vehicular and pedestrian surveys. These surveys delineated the project area into vegetation/habitat types based on changes in either vegetation or wildlife habitat conditions (e.g., substrate, topography). Descriptions were adapted from those of Brown's (1982) biotic communities (vegetation and wildlife habitat) of the Southwest. We evaluated conditions within 100 feet on either side of the proposed pipeline.

The project area traverses three biotic communities as mapped by Brown and Lowe (1980); semi-desert grassland, Chihuahuan desertscrub, and Arizona Upland subdivision of Sonoran desertscrub . Semi-desert grasslands, as defined by Brown (1982), cover extensive portions of western Texas, the southern half of New Mexico, southeast Arizona as well as contiguous Mexico. Chihuahuan desertscrub covers parts of western Texas, southern New Mexico, southeastern Arizona, and also extends south in the Mexico. The Arizona Upland subdivision covers large tracks of southern Arizona, Baja California, and the western half of the state of Sonora, Mexico. These widely distributed biotic communities were further categorized into vegetation/habitat types based on surveys the project area as described below:

1. Semi-desert Grassland: This is by far the most common type in the project area and includes Texas, New Mexico and Arizona. Mesquite (*Prosopis* spp.) and grasses are common along with a scrub/shrub layer that includes succulents. In some areas yuccas (*Yucca* spp.) form dense stands.

2. Mesquite Desert: In Texas and New Mexico, a type of semi-desert grassland where mesquite is either the dominant perennial plant or is a monoculture. The mesquites segregate spatially, often on sand hummocks, and do not form a continuous canopy. This type occurs on sandy soils.

3. Chihuahuan Desertscrub: In New Mexico and Arizona, shrubs and sub-shrubs are the dominate form. Creosotebush (*Larrea tridentata*) is typically the most common shrub. The shrubs typically segregate spatially do not form a continuous canopy.

4. Woodland/Semi-desert Grassland: This type occurs only in Arizona in the Apache Pass area (Segment C).

5. Sonoran Desertscrub: Occurs only in Arizona in the western most portion of the project area (Segment C). Shrubs and sub-shrubs are the dominant form. Creosotebush is typically the most common shrub. The shrubs typically segregate spatially but do not form a continuous canopy.

6. Salt Playa: The project area crosses the southern end of the Willcox Playa. Playas support predominantly salt tolerant grasses and other herbaceous plants as well as un-vegetated areas. The playa is an internally drained basin with high soil salt/mineral content. Salt playas are seasonally or occasionally flooded or saturated.

7. Agricultural: Areas of commercial crops.

8. Disturbed: Disturbed areas, such as those adjacent to roadways and railroads, either support no vegetation (i.e., bare ground) or are predominated by ruderal species with few native grasses, shrubs, or trees.

9. Xero-riparian (e.g., Shrub-Scrub Disclimax): This type is present in the numerous washes crossing the project area. These washes often support large trees relative to the upland areas; most commonly mesquite.

10. Riparian: Some isolated portions of the project area support large, broadleaf trees such as desert hackberry (*Celtis spinosa*), ash, and Fremont cottonwood (*Populus fremontii*); as well as salt cedar (*Tamarix* sp.).

3.8.1 Vegetation

3.8.1.1 Affected Environment

The proposed project area traverses several vegetation/habitat types within the Chihuahuan and Sonoran deserts as described above. Much of the project area is located immediately adjacent to the existing SFPP East Line right-of-way(s), other linear utilities, such as EPNG pipelines and fiber optic lines, Interstate-10, and the Union Pacific Railroad. As a result, portions of the project area (200 foot-wide area) are disturbed and support relatively few native plants. Areas supporting virtually no vegetation include existing facilities such as railroad tracks and pipeline access roads. The following describes the relatively undisturbed native vegetation of the project area.

Segment A.

Segment A is dominated by mesquite desert vegetation/habitat type (Table 3-8.1). This vegetation type is located on the portion of Segment A within Fort Bliss Military Reservation and El Paso International Airport. The landscape in this area is dominated by sand dunes with shrubby mesquite covering stabilized hummocks. Saltbush (*Atriplex* spp.), snakeweed (*Gutierrezia sarothrae*), and yuccas (*Yucca* spp.) area scattered throughout the area as well. The remaining portions of this segment are located within disturbed areas or paved private property.

TABLE 3-8.1
Vegetation/Habitat Types – Segment A

Vegetation/Habitat Type	Miles
Mesquite Desert	7.0
Disturbed	5.0
Total	12.0

Segment B.

Segment B continues northwest from the end point of Segment A. The portion of this segment located within El Paso County, Texas, leading up to the Franklin Mountains, is dominated by mesquite desert and agricultural land. Segment B then traverses a mosaic of Chihuahuan desertscrub and semi-desert grassland as mapped by Brown and Lowe (1980) over the Franklin Mountains. Chihuahuan desertscrub habitats are dominated by shrub species such as creosotebush (*Larrea tridentata*). Grasses are not particularly abundant in the desertscrub habitats, but the diversity of plants, including shrubs, cacti, and forbs, are often relatively high. The semi-desert grassland areas are often dominated by grasses such as

tobosa (*Hilaria mutica*), sideoats (*Bouteloua* spp.), tanglehead (*Heteropogon contortus*) as well as several other grass species. However, other common plants of semi-desert grassland include yuccas (*Yucca* spp.) as well as shrubby mesquite (*Prosopis* spp.), which are generally considered an invader of historically overgrazed grassland.

After crossing the Rio Grande River, the segment traverses a large agricultural area before returning to Chihuahuan desertscrub and semi-desert grassland habitat to its terminus at the Afton Station. Table 3-8.2 indicated the vegetation/habitat types of Segment B.

TABLE 3-8.2
Vegetation/Habitat Types – Segment B

Vegetation/Habitat Type	Miles
Mesquite Desert	2.3
Chihuahuan Desert Scrub	16.0
Semi-desert Grassland	2.5
Agricultural	8.8
Riparian	0.2
Disturbed	2.0
Total	31.8

Segment C.

Segment C traverses semi-desert grassland, Chihuahuan desertscrub, and Sonoran desertscrub as mapped by Brown and Lowe (1982). Segment C begins just east of Apache Pass situated between the Chiricahua and Dos Cabezas mountains. In this low pass the project area supports some vegetation characteristic of Madrean Evergreen Woodland (Brown and Lowe 1982). This biotic community extends north from the Sierra Madre of Mexico into the mountains of southeastern Arizona and southwestern New Mexico. At lower elevations, such as Apache Pass, the woodland is very open with widely separated evergreen oaks (*Quercus* spp.) and one-seed junipers (*Juniperus monosperma*). The woodland elements in this area are so poorly developed that we characterized the area between the start of this segment at MP 207.8 to MP 210.9 as woodland/semi-desert grassland. From MP 210.9 to MP 285 the native vegetation of the project area is predominately that of semi-desert grassland interspersed with patches of Chihuahuan desertscrub. Velvet mesquite is by far the most common tree in this portion of the project area. Mesquite in upland areas is generally considered an invader of historically overgrazed grasslands. Areas of semidesert grassland can also be dominated by grasses such as tobosa (*Hilaria mutica*), sideoats (*Bouteloua* spp.), tanglehead (*Heteropogon contortus*), Lehmann lovegrass (*Eragrostis lehmanniana*), plains bristlegrass (*Setarai macrostachya*), and Arizona cottontop (*Digitaria californica*). Common shrubs include false mesquite (*Calliandra eriophylla*), rabbit brush (*Chrysothamnus nauseosus var latisquameu*), Mormon tea (*Ephedra trifurca*), and broom snakeweed (*Gutierrezia sarothrae*). Ocotillo (*Fouquieria splendens*) and banana tree yucca (*Yucca baccata*) are present throughout the semi-desert grasslands and are locally common. Cholla (*Opuntia* spp.) and prickly pear cactus (*Opuntia* spp.) can be quite dense in some

locations. Pincushion (*Mammalaria* spp.), barrel (*Ferocactus wislizenii*), and hedgehog (*Echinocereus* spp.) are also common in some locations.

Much of this portion of the project area supports plants characteristic of both semi-desert grassland and Chihuahuan desertscrub. While velvet mesquite is characteristic of semi-desert grassland, creosotebush of characteristic of desertscrub, and both are common through out Segment C. Typical Chihuahuan desertscrub vegetation occurs on the eastern terraces of the San Pedro Valley approaching Benson between MP 256.8 and MP 259.8. This vegetation/habitat type is dominated by shrub species such as creosotebush. Grasses are not particularly abundant in desertscrub, but the diversity of plants, including shrubs, cacti, and forbs, is relatively high.

From approximately MP 285 east to the Tucson Terminal the project area is within the Sonoran Desert, Arizona Upland subdivision of Sonoran desertscrub biome. However, the vegetation is more characteristic of the Lower Colorado River subdivision in that typical Arizona Upland. Common species include creosotebush, desert broom (*Baccharis sarothroides*), brittlebrush (*Encelia farinosa*), saltbush (*Atriplex* spp.), and triange-leaf bursage (*Ambrosia deltoidea*). Many characteristic Arizona Upland species, such as saguaro cacti (*Carnegiea gigantea*), foothills palo verde (*Cercidium microphyllum*), and ironwood (*Olneya tesota*), are lacking or in low numbers. Cacti present in this area include barrel cactus (*Ferocactus* spp.) and pincushion cactus (*Mammillaria* spp.), prickly pear (*Opuntia* spp.), chollas (*Opuntia* spp.), and hedgehogs (*Echinocereus* spp.) scattered throughout the understory. Much of the area west of MP 295.5 is within urban Tucson with substantial areas cleared of vegetation.

Xero-riparian vegetation is present in the numerous washes crossing the project area. These washes often support large trees relative to the upland areas, most commonly velvet mesquite. Also present are desert willow (*Chilopsis linearis*), blue palo verdes (*Cercidium floridum*), catclaw acacias (*Acacia greggii*), and desert hackberry, and ironwoods. Washes that dissect desertscrub support a greater diversity of plants in terms of both species and structural composition than the surrounding uplands. The xero-riparian scrub associations occur in ephemeral drainages supporting trees and large shrubs. Larger mesquite is the most common tree species in these drainages.

Major drainages in the project area are the Goodwin Canyon, San Pedro River, Cienega Creek, Mescal Arroyo, and Davidson Canyon. Mescal Arroyo and Davidson Canyon are both tributaries of Cienega Creek. The alignment crosses the San Pedro River in a reach with ephemeral flow supporting predominately large salt cedar with a few, isolated, large cottonwood. This river supports high value riparian areas of global importance in other reaches, both upstream and downstream of the crossing. Cienega Creek, in the area of the alignment crossing, supports a stringer of velvet mesquite and few large Fremont's cottonwood. Mescal Arroyo supports a mesquite grove at the alignment crossing.

Davidson Canyon, a tributary of Cienega Creek, supports high value riparian vegetation in some reaches. On the slopes of the canyon are a few large saguaro cactus and foothill paloverde creating a very short segment of Arizona Upland vegetation outside of the TCE. Also present are scattered one-seed juniper. The area of the crossing supports riparian vegetation, primarily mesquite with a few broadleaf riparian trees (desert hackberry and ash).

The project area crosses active agricultural croplands in the Sulphur Springs Valley between MP 224.5 and MP 230.5 and another half mile starting at MP 237.5. Just east of the San Pedro River the line cross 0.2 miles of cropland.

The project area crosses 2.1 miles the southern end of the Willcox Playa. This area is nearly devoid of vegetation.

Table 3-8.3 lists the habitat types along with approximate amounts within Segment C.

TABLE 3-8.3
Vegetation/Habitat Types – Segment C

Vegetation/Habitat Type	Miles
Oak Woodland/Semi-desert Grassland	3.1
Semidesert Grassland	64.0
Chiuahuan Desertscrub	3.0
Sonoran Desertscrub	18.0
Agricultural	6.4
Salt Playa	2.1
Riparian	0.3
Total	96.9

3.8.1.2 Environmental Consequences

Proposed Action. Under the Proposed Action, all vegetation within the TCE would be disturbed for underground placement of the pipe. Segment A would be 14.0 miles in length, which totals approximately 169.7 acres of disturbance. Segment B would be 31.8 miles in length, which totals approximately 385.5 acres of disturbance. Segment C would be 96.9 miles in length, which totals approximately 1,174.5 acres of TCE clearance.

The primary impact of the project would be the clearing of existing vegetation. After construction activities have been completed, the TCE would be re-contoured to its original grade and vegetation allowed to grow to its natural state. However, desert areas may take more than 10 to re-vegetate following construction. There would be short-term and long-term losses of vegetation resulting from the Proposed Action due to any new access roads and access road improvements. Some clearing would include areas of relatively undisturbed vegetation. Plants salvaged by the National Park Service on their lands would be replanted. As previously noted, the native vegetation of the project area is representative of regionally common biotic communities, most notably semi-desert grasslands.

Mitigation would be effective in preventing noxious weeds from being introduced into the project area or spread along through the project area. A noxious weed is defined as a plant species that has been introduced to an area following European settlement and has been determined to have negative economic and environmental effects. Noxious weeds are often very successful colonizers of disturbed areas and can completely dominate an area indefinitely. The term "noxious weeds" is a legal classification, not an ecological term. Noxious weed lists vary from state to state. No noxious weeds as listed by the Arizona

Department of Agriculture were observed in the project area during field surveys. Exotic plants (=non-native) are any species not indigenous to a given area prior to European settlement. Salt cedar (*Tamarix* sp.) and Mediterranean grass (*Schismus* sp.) are two exotic species observed in the project area.

No Action Alternative. Under the No Action alternative, no ground disturbing activities would occur for the proposed project areas. The No Action alternative would have no immediate affect on vegetation. No mitigation would be required. However, continued aging of the existing pipeline could lead to increased maintenance activities. Such activities could be in emergency situations, which could lead to unforeseen impacts to vegetation.

3.8.2 Wildlife and Wildlife Habitats

3.8.2.1 Affected Environment

With regards to wildlife and wildlife habitat, the project area was categorized in the field as to vegetation/habitat types based on changes in either vegetation or other wildlife habitat features (e.g., substrate, topography). These types are described and quantified in the preceding section on vegetation (3.7.1). Important regional wildlife habitat types that are not located within the project area include mountain woodlands and forests. High value riparian habitat is also not crossed by the project area. The Rio Grande River, San Pedro River, and Cienega Creek including its tributaries, are traversed by the proposed alignment. However, these major drainages do not support high value riparian habitats at the proposed crossing. The Proposed Project crosses numerous desert washes that can be important wildlife movement corridors. However, in many cases the value of these washes to wildlife movement is disrupted by the presence of U.S. Interstate 10 and the Union Pacific Railroad.

Many wildlife species are common to both the Chihuahuan and Sonoran desert communities. Reptile species characteristic of both deserts include whiptail lizards (*Cnemidophorus* spp.), zebra-tailed lizard (*Callisaurus draonoides*), tree lizard *(Urosaurus ornatus)*, side-blotched lizard (*Uta stansburiana*), gopher snake (*Pituophis melanoleucus*), and western diamondback rattlesnake (*Crotalus atrox*). Bird species include cactus wren (*Campylorhynchus brunneicapillus*), greater roadrunner (*Geococcyx californianus*), curve-billed thrasher (*Toxostoma curvirostre*), and red-tailed hawk (*Buteo jamaicensis*). Characteristic and common mammals include the white-throated woodrat (*Neotoma albigula*), Merriam's kangaroo rat (*Dipodomys merriami*), black-tailed jackrabbit (*Lepus californicus*), desert cottontail (*Sylvilagus audubonii*l), and coyote (*Canis latrans*).

Segment A. The wildlife habitats present within Segment A are characteristic of mesquite desert landscape of the Chihuahuan Desert region. Coyotes, jackrabbits, and desert cottontails are most certainly common mammals in the area. Bird species such as the red-tailed hawk, western kingbird, and scaled quail (*Callipepla squamata*) are common to the area as well. Collared lizards and whiptails are common reptile species found in the area.

Segment B. Vegetation/habitat types within Segment B are primarily a mosaic of semi-desert grasslands and Chihuahuan desertscrub. Wildlife species are typical of the Chihuahuan desertscrub habitat. Birds common to this area include the red-tailed hawk, golden eagle (*Aquila chrysaetos*), American kestrel (*Falco sparverius*), black-throated sparrow (*Amphispiza bilineata*), and cactus wren (*Campylorhynchus brunneicapillus*). Common reptiles

include the common collard lizard (*Crotaphytus collaris*), side-blotched lizard, Chihuahuan spotted whiptail (*Cnemidophorus exsanguis*), gopher snake, and western diamond rattlesnake (*Crotalus atrox*).

Mammals typically associated with semi-desert grassland and Chihuahuan desertscrub and observed in the project area included desert cottontail, black-tailed jack rabbit, round-tailed ground squirrel *(Spermophilus terticaudus)*, and coyote.

Segment C. Vegetation/habitat types within Segment C consist of semi-desert grasslands and Chihuahuan desertscrub with approximately 18 miles of Sonoran desertscrub as the alignment approaches the Tucson Terminal. Reptiles observed in the project area include the western whiptail (*Cnemidophorus tigris*), zebra-tailed lizard, side-blotched lizard (*Uta stansburiana*), paint desert glossy snake (*Arizona elegans philipi*), and gopher snake. Birds typically associated with semidesert grasslands and Chihuahuan desertscrub observed during field surveys included Swainson's hawk (*Buteo swainsoni*), American kestrel (*Falco sparverius*), scaled quail (*Callipepla squamata*), western burrowing owl (*Athene cunicularia*), Say's phoebe (*Sayornis saya*), Chihuahuan raven (*Corvus cryptoleucus*), loggerhead shrike (*Lanius ludovicianus*), and western meadowlark (*Sturnella neglecta*). Within the Sonoran desertscrub common birds included the Harris' hawk (*Parabuteo unicinctus*), white-winged dove (*Zenaida macroura*), Gila woodpecker (*Melanerpes uropygialis*), Bendire's thrasher (*Toxostoma bendirei*), and northern cardinal (*Cardinalis cardinalis*). Common mammal species observed in the project area included the round-tailed ground squirrel (*Spermophilus tereticaudus*), desert woodrat (*Neotoma lepida*), black-tailed jackrabbit, desert cottontail, coyote, and mule deer (*Odocoileus hemionus*). The numerous washes that dissect desertscrub support a greater diversity of plants in terms of both species and structural composition and, therefore, a greater variety of wildlife.

3.8.2.2 Environmental Consequences

Proposed Action.

During construction many wildlife species would be disturbed by vegetation clearing and by temporary displacement (e.g., construction noise). Smaller, less mobile wildlife, such as small mammals and reptiles, could be crushed by construction equipment during initial grading. Other wildlife, such as birds and larger mammals, would leave the vicinity of the TCE as construction activities approach. Many of these animals may relocate into similar habitats nearby. These effects however would diminish after construction when wildlife returns to the newly disturbed areas and adjacent, undisturbed habitat. However, much of the project area parallels existing linear facilities including access roads, I-10 and frontage roads, UPRR, fiber optic cables, and other pipelines. Thus, wildlife in the project area is currently exposed to noise and other human disturbances. The addition of the Proposed Action in these portions of the project area would represent a minor increase in exposure to noise and other potentially disturbing activities resulting from construction, operation, and maintenance activities.

There would be short-term and long-term losses of wildlife habitat resulting from the Proposed Action due to vegetation clearance and new access roads and access road improvements. Some clearing would include areas of relatively undisturbed wildlife habitat. Primary impact of the project on wildlife habitat would be the clearing of existing

vegetation. Desert areas may take more than 10 years to re-vegetate following construction. However, the affected vegetation/habitat types (e.g., semi-desert grassland, creosotebush scrub) are widespread throughout the Chihuahuan and Sonoran desert region as are the wildlife they support. There are desert washes crossed by the Proposed Project that may be utilized as wildlife corridors. Impacts from construction activities within the washes would be of short duration. Long-term impacts to wildlife utilizing these corridors are expected to be minimal.

During construction, a 5 to 6-foot deep and 2 to 3-foot wide ditch is typically excavated. An open ditch can be hazardous to wildlife in that they can become trapped in the open ditch.

The Migratory Bird Treaty Act of 1918 (MBTA), as amended (16 United States Code [USC] 703-712) is an international agreement between the United States, Canada, and Mexico that protects designated species of birds. Virtually all birds are protected under the MBTA, with three exceptions (English sparrows, rock dove, and European starlings). A complete list of all species of migratory birds protected by the MBTA can be found at 50 CFR 10.13. The MBTA controls the taking of these birds, their nests, eggs, parts, or products.

To the extent practicable, impacts to migratory birds would be minimized by avoiding disturbance to active nests during the breeding season. Should work be conducted during nesting season, areas of construction where vegetation would be cleared would be examined to determine if active nests are present. If active nesting is observed by environmental monitors, steps would be taken to avoid disturbance to the nest. If impacts appear to be unavoidable, an outside expert would be contacted to relocate the nest and the appropriate state wildlife agency would be contacted. However, no active nests were observed in the project area during biological surveys and no impacts to nesting birds are anticipated.

Proposed staging areas, laydown areas, pump stations, and expansion of existing terminals are typically clear of vegetation and are situated in developed and previously disturbed areas.

No Action Alternative. Under the No Action alternative, no ground disturbing activities would occur for the proposed project areas. The No Action alternative would have no immediate affect on wildlife. No mitigation would be required. However, continued aging of the existing pipeline could lead to increased maintenance activities. Such activities could be in emergency situations, which could lead to unforeseen impacts to wildlife.

3.9 Special Status Species

Special status species are species listed by USFWS as threatened, endangered, proposed for listing as threatened or endangered, or are candidates for protection under the Endangered Species Act. Also included here are those on lists maintained by the BLM, New Mexico Department of Game and Fish (NMDGF), Arizona Game and Fish Department (AGFD), and BLM.

Definitions for species on USFWS lists are:

- Endangered (E) = Any species that is in danger of extinction throughout all or a significant portion of its range.
- Threatened (T) = Any species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.
- Proposed (PT, PE) = Any species that has been proposed for listing as a threatened or endangered species.
- Candidate (C) = Any species for which there is sufficient information on biological vulnerability and threats to support a proposal to list as endangered or threatened but for which preparation and publication of a proposal is precluded by higher-priority listing actions.

The BLM maintains a list of species considered "sensitive" (BLM-S). The definition for sensitive is "….those taxa occurring on BLM Field Office Lands in New Mexico/Arizona which are considered sensitive by the New Mexico/Arizona State Office.

The NMDGF maintains a list of Wildlife of Concern that includes species categorized as endangered, threatened, or sensitive. The NMDGF maintains a database of information on these species within the State as well as those protected by the Federal ESA. The AGFD maintains a list of Wildlife of Special Concern in Arizona (WSCA). These are defined as species whose occurrence in Arizona is or may be in jeopardy, or known or perceived threats or population declines, as described by the AGFD's listing of WSCA (AGFD prep.). These are currently the same as those in the Threatened Native Wildlife in Arizona (AGFD 1988).

Each species was evaluated in terms of the likelihood of it occurring in the project area and then the potential for the species, or its habitat, to be impacted (affected) by the Proposed Action.

Lists of species protected by the ESA, or candidates for protection, for all counties traversed by the project were reviewed prior to conducting field surveys. Habitats were assessed in the field for their potential to support special status species of plant and wildlife.

3.9.1 Affected Environment

The following is a description of the special status species that may be affected by implementation of the Proposed Action. Table 3-9.1 lists these species and their status. There is no designated Critical Habitat within the project area.

TABLE 3-9.1
Special Status Species Potentially Affected by the Proposed Action

Common Name	*Scientific Name*	Status
PLANTS		
Pima pineapple cactus	*Coryphantha scheeri robustispina*	Endangered
Sand prickly-pear cactus	*Opuntia arenaria*	New Mexico - Threatened
REPTILES		
Desert tortoise-Sonoran population	*Gopherus agassizi*	BLM Sensitive, AZ-WC
Texas horned lizard	*Phrynosoma cornutum*	BLM Sensitive
BIRDS		
Cactus ferruginous pygmy-owl	*Glaucidium brasilianum cactorum*	Endangered
Western burrowing owl	*Athene cunicularia*	BLM Sensitive
MAMMALS		
Jaguar	*Panthera onca*	Endangered
Lesser long-nosed bat	*Leptonycteris curasoae yerbabuenae*	Endangered
Cave myotis	*Myotis velifer*	BLM Sensitive
Fringed myotis	*Myotis thysanodes*	BLM Sensitive
Mexican long-nosed bat	*Leptonycteris nivalis*	Endangered
Mexican long-tongued bat	*Choeronycteris Mexicana*	BLM Sensitive, AZ-WC
Western small-footed myotis	*Myotis cillolabrum*	BLM Sensitive
California leaf-nosed bat	*Macrotis californicus*	BLM Sensitive, AZ-WC

Endangered—A species that is considered to be in danger of extinction throughout all or a significant portion of its range and is listed under the Endangered Species Act.
Candidate—Any species for which there is sufficient information on biological vulnerability and threats to support a proposal to list as endangered or threatened but for which preparation and publication of a proposal by the USFWS is precluded by higher-priority listing actions.
BLM Sensitive—Species occurring on BLM land that are considered sensitive by the state offices.
New Mexico - Threatened—A species that is likely to become endangered within the foreseeable future throughout all or a significant portion of its range in New Mexico as determined by the New Mexico Department of Game and Fish.
AZ-WC = Wildlife of Special Concern in Arizona—Species whose occurrence in Arizona is or may be in jeopardy, or with known or perceived threats or population declines, as described by the Arizona Game and Fish Department's listing of Wildlife of Special Concern in Arizona October 1996 Draft.

Forty-four additional special status species are known to occur, or may potentially occur, within the Texas, New Mexico, and Arizona counties through which the proposed project passes. Observation of the proposed TCE and the surrounding area indicated that no suitable habitats exist for these species in or near the project area. Therefore, these species

would not be impacted (i.e., no affect) as a result of the proposed project and have been eliminated from further consideration. These 44 species are identified in Appendix F of this document along with the rationale for their elimination. Also included below is the rationale for elimination from further consideration of special status species associated with the riparian, wetland, and aquatic habitats of the San Pedro River, Santa Cruz River, and Cienega Creek drainages.

Riparian and Wetland Area Species Eliminated from Further Consideration in Segment C. Many special status species in arid Southwest are dependent on riparian, wetland, and aquatic habitats. Species identified as occurring within drainages crossed by the proposed project include:

- Huachuca water umbel (Lilaeopsis schaffneriana ssp. recurva)
- Gila chub (Gila intermedia)
- Gila topminnow (Poeciliopsis occidentalis)
- Chiricahua leopard frog (Rana chiricahuensis)
- Southwestern willow flycatcher (Empidonax traillii extimus)
- western yellow-billed cuckoo (Coccyzus americanus occidentalis)

Habitat known to support these species does not exist in the project area, however, the San Pedro River, Santa Cruz River, and Cienega Creek does offer habitat for these species in other portions of these drainages.

The Huachuca water umbel is known from the San Pedro River, Santa Cruz River, Rio Yaqui, and Rio Sonora watersheds between 3,500 and 6,500 feet (USFWS 1999). It is a perennial plant found in cienegas, perennial low gradient streams, and marshy wetlands (AGFD 2003). The water umbel has been recorded in Empire Gulch, a tributary of Cienega Creek, and may occur further downstream in the Cienega Creek drainage, but not within the vicinity of the project area.

The historical distribution of Gila chub and Gila topminnow included headwater streams of the Gila River drainage of Arizona and New Mexico as well as the Santa Cruz and San Pedro rivers of Arizona and Sonora, Mexico. Portions of Cienega Creek, both upstream and downstream of the alignment, are proposed critical habitat for the Gila Chub (USFWS 2002). The proposed critical habitat upstream of the alignment is also identified in Pima County's SDCP as an area with populations of this species (RECON 2002). As previously noted, there are no perennial flows in the area of the proposed crossings to support these species.

The project area is within the southeastern portion of the Chiricahua leopard frog's range that also extends south into the Sierra Madre Occidental of Mexico (Sredl et al. 1997). Habitat for the species includes natural and man-made aquatic systems including rocky streams, permanent springs, and stock tanks within chaparral, grassland, and desert communities (AGFD 2001). Cienega Creek both upstream and downstream of the protect area supports high value habitat.

During migration, southwestern willow flycatchers use a variety of habitats and may be encountered in all but the most sparsely vegetated desert habitats. Cienega Creek and San Pedro River, as well as their tributaries, provide nesting habitat for this species in other reaches of these drainages.

The western yellow-billed cuckoo's preferred habitat is riparian areas of cottonwood-willow riparian although it will use areas of isolated willow and cottonwood mixed with tall mesquite (Rosenberg et al. 1991). Cienega Creek has been identified in Pima County's SDCP as an area needed for inclusion in a reserve system for this species (RECON 2002). However, Cienega Creek in the area of the alignment crossing does not support the appropriate habitat.

Pima pineapple cactus. The Pima pineapple cactus (*Coryphantha scheeri robustispina*) is a small round shaped cactus growing from around 2 to 18 inches high and from 3 to 7 inches wide. Plants are either single or multi-stemmed with clusters of Pima pineapple cactus stems forming mostly from vegetative clones produced at the base of the plant. It is an easily identified plant given the presence of one stout, straw-colored, hooked central spine with radial spines extending laterally around the central spine (Benson 1982). Typically the Pima pineapple cactus grows on gentle slopes of less than 10 percent and along the tops (upland areas) of alluvial bajadas nearest to the basins coming down from steep rocky slopes. The Pima pineapple cactus is found at elevations between 2,360 and 4,700 feet. Vegetation is characterized as either the Arizona Upland Subdivision of the Sonoran Desert scrub or semi-desert grasslands or as a combination of the two. Densities range from between 0.05-3 plants per acre, however, less than 1 plant per acre is typical. Plant distribution tends to be clumped.

The Pima pineapple cactus is known from south and east of Tucson, in Pima and Santa Cruz counties, Arizona and adjacent northern Sonora, Mexico. It occurs at low densities throughout both the Altar and Santa Cruz valleys, and in low-lying areas connecting the two valleys. It was listed as endangered in September 1993 without designated critical habitat. Factors identified as contributing to the need to list this species included habitat loss, modification, and fragmentation; relatively limited distribution, rareness, and illegal collection.

Sand prickly-pear cactus. Sand prickly pear (*Opuntia arenaria*) is a New Mexico threatened species known from a few localities in sandy soils including dunes, floodplains, and arroyos in extreme southeastern New Mexico. The range of this cactus includes southern Dona Ana, Luna, and Socorro Counties of New Mexico as well as adjacent El Paso County, Texas and Chihuahua, Mexico. This species has a distinctive appearance with much thicker and narrower stem joints compared to typical prickly pear. It more closely resembles a cholla. It is low growing with stems consisting of loosely attached flattened joints up to 8 cm in length by 2-3 cm in width. The cactus produces yellow flowers from May to June. Sand prickly pear can be found in sandy areas, particularly semi-stabilized sand dunes among open Chihuahuan desert scrub. It is often found with honey mesquite and a sparse cover of grasses at an elevation of 3,800 to 4,300 feet.

Texas horned lizard. The Texas horned lizard (*Phrynosoma cornutum*) is a BLM-sensitive species. Their range includes western Texas, southern New Mexico, and extreme southeast Arizona. Their habitat is open semi-desert grasslands and desertscrub. These are flat-bodied lizards with numerous horns on the head and a brownish color. It is the only species of horned lizard to have dark brown stripes that radiate downward from the eyes and across the top of the head. Texas horned lizards hibernate from September–October until

April–May, at which time they begin mating. These lizards are ant specialists, feeding on large amounts of harvester ants.

Desert tortoise (Sonoran Population). The desert tortoise (*Gopherus agassizii*), Sonoran Population, is a BLM-Sensitive species as well as a WSCA in Arizona (AGFD, in prep.) The desert tortoise is a completely terrestrial species distinguished by a high domed shell with prominent growth rings on both the upper and lower portions of the shell. The Sonoran Population in Arizona ranges from the Kingman area south to the Chocolate Mountains (Arizona), and southeast to the San Pedro River area (Johnson et al. 1990, Palmer and Ladehoff 1991). The Arizona project area is located within the range of this species. In the Sonoran Desert, tortoises appear to be most abundant in the Arizona Upland subdivision (Germano et al. 1994).

Cactus ferruginous pygmy-owl. The cactus ferruginous pygmy-owl (CFPO) (*Glaucidium brasilianum cactorum*) was listed as Endangered by the USFWS on March 3, 1997 (62 FR 10730) and is also on the list of WSCA in Arizona (AGFD, in prep.). It is currently in the process of being de-listed. The species ranges from lowland south-central Arizona and extreme southeastern Texas and south through Mexico. It is common in Mexico.

The CFPO is a small reddish brown or grayish bird that is found in Sonoran Desertscrub habitats characterized by braided wash systems and dense vegetation including ironwood, mesquite, and paloverde; and semidesert grasslands containing drainages with mesquite, hackberry, and ash. Suitable nesting habitat for the CFPO is defined as areas below 4,000 feet in elevation containing saguaro cacti or other columnar cacti that are at least 8-feet tall, or ironwood, mesquites, paloverde, or other large trees with a trunk diameter of at least 6-inches dbh (diameter at breast height as measured at 4.5 feet above the ground) (AGFD and USFWS 2000). Recent observations of CFPOs have been primarily within the Arizona Upland Subdivision of the Sonoran desertscrub. These small owls nest in cavities in such forms of vegetation during late winter and early spring. Juveniles typically disperse from natal areas between July and August and do not appear to defend a territory until September. Direction of dispersal appears to be random and the owl is capable of dispersal up to 22 miles.

Western burrowing owl. The western burrowing owl (*Athene cunicularia*), a BLM-Sensitive species, occupies open areas, such as grasslands, desertscrub, and the edges of agricultural fields. They also inhabit golf courses, airports, cemeteries, vacant lots, and road embankments or wherever there is sufficient friable soil for a nesting burrow, which is a critical habitat requirement for burrowing owls. Owls use these burrows for nesting and also require access to alternate burrows providing escape cover for adults and fledglings. Burrowing owls are dependent on fossorial mammals such as badgers, ground squirrels, and prairie dogs to create burrows. In southern New Mexico and Arizona, most owls are year-round residents.

Jaguar. The jaguar (*Panthera onca*) was federally listed as endangered throughout its historic United States range, including New Mexico and Arizona, on July 22, 1997 (62 FR 39147). The jaguar is also on the list of Wildlife Species of Concern in Arizona (AGFD in prep).

The range of the species extends from southern New Mexico and Arizona south through Central and South America. Jaguars occupy a wide range of habitats including tropical rain

forests and deserts. In the northern edge of the species' range (including New Mexico and Arizona), its habitat is described as including arid mountain scrub and oak/pine woodlands. As with other large predators, suitable habitat is likely to be related to the prey base rather than the vegetation type. The closest know population is 135 miles south of the international border in Sonora, Mexico. Individuals wandering north into Arizona are part of that population (Rinkevich and Bashum 2003). Illegal shooting is the greatest threat to the jaguar in the United States.

Lesser long-nosed bat. The lesser long-nosed bat (*Leptonycteris curasoae yerbabuenae*) was listed as endangered by the USFWS on September 30, 1988 (53 FR 38456) without designated critical habitat. It also is considered a WSCA by the AGFD (in prep.). The lesser long-nosed bat is a medium-sized bat with a distinctively elongated nose with a leaf-shaped tip. Their known range extends from extreme southwestern New Mexico and southeastern Arizona north to the Phoenix area, west to the Aqua Dulce Mountains, and south through western Mexico (USFWS, 1995).

Lesser long-nosed bats are summer residents within semi-desert grasslands and Sonoran desertscrub, Arizona Upland Subdivision up to the edge of oak woodland (Hoffmeister, 1986; USFWS, 1995). They begin migration into Arizona in early April. When they arrive, the females are pregnant and congregate in maternity colonies while males occupy separate roosts. The young are born between early May and late June (Hoffmeister, 1986). They migrate south in the fall, leaving Arizona and New Mexico by early October (Hayward and Cockrum, 1971). Lesser long-nosed bats are nectar and pollen feeders, foraging at night in areas of saguaro and agave. While feeding, they either land on the plant or hover like a hummingbird (Hoffmeister, 1986). Lesser long-nosed bats fly long distances (up to 75 miles) between roosting and feeding areas (USFWS, 1995). During the day they roost in mine tunnels and natural caves (Hayward and Cockrum, 1971). Threats to the lesser long-nosed bat have been identified as the destruction or disturbance of roosting sites and possible loss of agave populations.

Cave myotis. The cave myotis (*Myotis velifer*), a BLM-Sensitive species, occurs in desertscrub areas of the region in conjunction with water sources. This species is dependent on mine shafts and tunnels for roosting. This species is a colonial cave dwelling bat. They also may roost in rock crevices, old buildings, carports, under bridges, and even in abandoned cliff swallow nests. The cave myotis forms nursery colonies, usually numbering in the thousands in caves, mines, barns, buildings, and sometimes under bridges. It is found throughout the southwest from central Oklahoma and Texas westward through the southern half of New Mexico and Arizona. Cave myotis are aerial insectivores and feed on a wide variety of insects including moths, weevils, antlions, small beetles, and flying ants. Because these bats congregate in large groups, they are very susceptible to human disturbance.

Fringed myotis. The fringed myotis (*Myotis thysanodes*), a BLM-Sensitive species, is known from low deserts and grassland areas to ponderosa pine and spruce-fir forests. This species ranges through western North America from Canada to southern Mexico. Fringed myotis roost in caves, mines, and buildings.

Mexican long-nosed bat. The Mexican long-nosed bat (*Leptonycteris nivalis*) was listed as endangered by the USFWS on September 30, 1988 (53 FR 38456) without designated critical habitat. It is also considered a WSCA in Arizona by the AGFD (in prep.). This species

roosts in small groups, usually in canyons, caves and mine tunnels, but also in relatively exposed locations. They are found in Arizona from the Chiricahuas to the Santa Catalinas and Baboquivaris, and into southwestern New Mexico. Their preferred habitat is Sacaton grasslands, sycamore, cottonwood, rabbitbrush, oak savanna, and coniferous forest. This species winters in Mexico and is a resident of Arizona and New Mexico scrub habitat during the spring and summer months when the plant communities are flowering and nectar is abundant (AGFD 1993).

Mexican long-tongued bat. The Mexican long-tongued bat (*Choeronycteris mexicana*) is a BLM-Sensitive species. Its range extends from the southern part of the southwestern United States to Honduras and Guatemala. In the United States, it is known mainly from desert habitats between 2,000 and 8,000 feet. The diet consists of nectar and pollen of night-blooming succulents. This species is known to use natural caves, buildings, and old mine tunnels for day roosts. Colonies usually contain several dozen bats, although solitary individuals and groups of 2 to 12 have been recorded.

Western small-footed myotis. The western small-footed myotis (*Myotis cillolabrum*), a BLM-Sensitive species, ranges over most of western North America. They are known from oak, chaparral, and riparian areas within the region. This species habitat requirements are poorly known, however, they are know to use natural caves, buildings, old mine tunnels, and tree bark for roost sites.

California Leaf-nosed Bat. The California leaf-nosed bat (*Macrotus californicus*) is a BLM-Sensitive species as well as WSCA in Arizona (AGFD, in prep.). These occur throughout the Mojave and Sonoran deserts and occasionally in the Chihuahuan Desert. It is a year-round resident in desertscrub habitats (mostly Sonoran desertscrub) of southern and western Arizona south of the Mogollon Rim (Hoffmeister 1986). They are locally common, roosting colonially in mines, caves, and under bridges (AGFD 1988; Cockrum 1980). California leaf-nosed bats remain active throughout the year in Sonoran desertscrub habitats due to the relatively mild climate and continuous availability of food. They feed primarily on large, night-flying beetles, grasshoppers, and moths which are taken in flight. They also feed on insect larvae, especially of butterflies, which are taken from the bushes or on the ground. There is some evidence that they also feed on fruits, including cacti. Their home range and local seasonal movements are largely unknown (Hoffmeister 1986). Its numbers are thought to be low, apparently due to limited winter roosts and vandalism at roost sites (AGFD 1988).

3.9.1.1 Segment A

Texas horned lizard. Potentially suitable habitat exists along portions of Segment A, particularly in the open areas with sparse plant cover. No individuals were observed during field surveys.

Sand prickly-pear cactus. Potentially suitable habitat exists for the sand prickly-pear cactus within the Segment A; however, this species is not known to occur in the vicinity of the project area and was not observed during field surveys.

3.9.1.2 Segment B

Texas horned lizard. Potentially suitable habitat exists along portions of Segment B, particularly in the open areas with sparse plant cover. No individuals were observed during field surveys.

Sand prickly-pear cactus. Potentially suitable habitat exists for the sand prickly-pear cactus within the Segment B; however, this species was not observed during field surveys. A small population exists just north of the proposed ROW, outside the 200 foot survey area, at approximately MP 30.5.

3.9.1.3 Segment C

Pima pineapple cactus. The proposed alignment crosses the northern edge of the species known range. A range map developed for Pima pineapple cactus (Arizona Game and Fish Departments Heritage Data Management System map dated December 11, 2003) was used to determine potential habitat. Using this map and a two-mile the buffer area, the route between approximately milepost (MP) 283.2 and MP 300 would be considered potential habitat. This potential habitat estimate was further refined to the area between MP 284 (just west of Davidson Canyon) and MP 295 based on reconnaissance surveys. This 11 mile area was surveyed following methods developed by Roller (1996). Biologists walked parallel, transects not greater than 20 feet (6 meters) per transect to obtain 100 per coverage of a 200 foot-wide area centered on the proposed centerline. The width of the survey transects was adjusted in the field based on visibility (i.e., plant density), although transect width did not exceed 20 feet.

A total of 27 living plants and one dead plant were observed within or adjacent to the 200 foot-wide survey corridor. Of these, 5 plants were located within the currently proposed 100 foot-wide TCE. All plants were observed between MP 284.9 and MP 290.1. As is typical for this plant, locations were clumped in habitat patches. Approximately 0.8 mile of the proposed west of MP 290.1 was not surveyed due lack of permission from the landowner. This area appeared to be suitable habitat. Therefore, the six mile area between MP 284.9 to MP 290.9 was determined to be occupied Pima pineapple cactus habitat. East of MP 284 where the line crosses Davidson Canyon the vegetation is more typical of semi-desert grassland and slopes are greater than 10 percent. The area likely represents the eastern extent of the species range. West of MP 292, the undisturbed vegetation is predominately dense creosotebush scrub; more typical of the Colorado River Subdivision of the Sonoran Desert. The fine grained soils west of MP 292 do not appear to be suitable habitat for Pima pineapple cactus and none were observed. Much of this portion of the route is urban with substantial areas cleared of vegetation.

Desert tortoise. Within the Segment C project area the San Pedro River represents the eastern most extension of the species range (Arizona Interagency Desert Tortoise Team 2000). While tortoise could occur anywhere in the project area west of the San Pedro River, they are more likely to occur in their preferred habitat in areas of Sonoran desertscrub, especially of Arizona Upland vegetation in the western potions of the project area in the vicinity of Tucson. However, no individuals or tortoise sign was observed during field surveys.

Cactus ferruginous pygmy-owl. Segment C is located not located within potential breeding of this species. The project area is within potential dispersal habitat although no individuals are known to currently use the area.

Western burrowing owl. Potentially suitable habitat is present within the project area. No owls or burrows were observed during field surveys. Suitable habitat for burrowing owl occurs in portions of the project area adjacent to agricultural fields and open grasslands, however, they could inhabitant virtually any portion of Segment C.

Jaguar. It is conceivable that an individual could wander as far north as the project area, especially through the Apache Pass, Cienega Creek and San Pedro River areas. However, the closest known population is 135 miles south of the international border in Sonora, Mexico.

Lesser long-nosed bat. This species may potentially forage in the project area; however, there are no potential roosts or maternity sites in the project area. The absence of dense stands of saguaro and agaves in the project area reduces the likelihood of this species foraging in the area.

Cave myotis. This species may forage in the project area; however, there are no potential roost sites or maternity sites in the project area.

Fringed myotis. This species may forage in the project area; however, there are no potential roosts or maternity sites in the project area.

Mexican long-nosed bat. This species may forage in the project area; however, there are no potential roosts or maternity sites in the project area. The absence of dense stands of agave reduces the potential for this species to forage in the area.

Mexican long-tongued bat. This species may forage in the project area; however, there are no potential roosts or maternity sites in the project area. Potential feeding habitat was observed in New Mexico and Arizona.

Western small-footed myotis. This species may forage in the project area; however, there are no potential roost sites or maternity sites in the project area.

California leaf-nosed bat. This species may potentially forage in the project area; however, there are no potential roosts or maternity sites in the project area.

3.9.1.5 Ancillary Facilities

No potentially suitable habitat exists for special status species within the proposed El Paso Breakout Facility, existing pump stations, existing terminals, new and existing valves, cathodic protection test stations, or pipeline markers. No individual special status species were observed at any of the proposed ancillary facility sites during field surveys.

3.9.2 Environmental Consequences

3.9.2.1 Proposed Action

The following summarizes the effects of the Proposed Action alternative on special status species potentially occurring within the project area.

The proposed EPX decreases the potential for a release of volatile petroleum products by eliminating the need for long hauling of petroleum products in thousands of trucks on the associated roads and highways (e.g., Interstate – 10). The pipeline is the safest alternative to truck hauling for meeting the increasing demand for petroleum products of the Tucson/Phoenix area.

The potential for a product release into the Cienega Creek or any other watershed as a result of construction, operation, and maintenance of the EPX Project is so remote as to be discountable. Dating back to 1990, with 2,045 miles of products pipelines in the southern region, SFPP has experienced a total of 6 releases, 3 of which were caused by unauthorized third-party digging operations. This equates to approximately 1 release every 5,500 years at any given one mile of pipe. Additionally, the new pipe is less likely to rupture than the pipe being replaced.

Segment A.

Texas horned lizard. The Proposed Action would have no direct effects on individual Texas horned lizards. The Proposed Action may have an indirect effect on individuals by impacting potential habitat within the ROW. This potential impact would be minimal considering the amount of potential habitat surrounding the proposed project area.

Sand prickly pear cactus. The Proposed Action would have no direct effects on individual sand prickly-pear cacti. The Proposed Action may have an indirect effect on the species by impacting potential habitat within the ROW. This potential impact would be minimal considering the amount of potential habitat surrounding the proposed project area. Additionally, the proposed project area would follow alongside existing linear ROWs that produce continual disturbance to the area.

Segment B.

Texas horned lizard. The Proposed Action would have no direct effects on individual Texas horned lizards. The Proposed Action may have an indirect effect on individuals by impacting potential habitat within the ROW. This potential impact would be minimal considering the amount of potential habitat surrounding the proposed project area.

Sand prickly pear cactus. The Proposed Action would have no direct effects on individual sand prickly-pear cacti. The Proposed Action may have an indirect effect on the species by impacting potential habitat within the ROW. This potential impact would be minimal considering the amount of potential habitat surrounding the proposed project area. Additionally, the proposed project area would follow alongside existing linear ROWs that produce continual disturbance to the area.

Segment C.

Pima pineapple cactus. The proposed action would result in the loss of a minimum of 5 PPC situated within the project's TCE. An additional 22 plants are located adjacent to the TCE and are avoidable. These plants would be clearly marked and protected during construction to insure they are avoided by construction activity.

Within the TCE approximately 72.7 acres (6 miles x 100 feet) having the potential to support plants would be cleared. However, as noted during the survey and in the literature, the

plants are distributed in relatively discrete, widely spaced clumps. Some portions of the TCE within potential habitat have been cleared and are in use as access for the UPPR or other development and do not currently have the potential to support vegetation.

Suitable PPC habitat would be disturbed due to construction activities. All disturbances would temporary, but long-term (greater than 10 years). The removal of vegetation will change water infiltration, compact soil, change local site conditions, and alter the seed bank. PPC can re-occupy areas of recent disturbance, as competition with other plants for nutrients and light are reduced. PPC plants have re-occupied the survey corridor within the TCE of two the existing pipelines, but not directly over the trench area of the existing pipes.

There would be no permanent loss of PPC habitat resulting from the proposed project with the possible exception of the area directly over the pipeline.

Increases in public access and off-highway vehicle use are not anticipated as a result of project implementation. No new access would be created.

A pre-construction survey for PPC would be conducted from MP 284 to MP 292 to locate any plants that may have been missed during the original survey effort. To the extent practical, any newly located PPC located would also be avoided. This would require an additional one or two passes of the TCE depending on whether additional plants are located. USFWS would be informed of any additional, unavoidable PPC located during pre-construction surveys. All of the PPC to be avoided would be clearly marked before construction.

Monitoring of construction would be required from MP 284 to MP 292 for all construction related activity; including pre-construction surveys and staking of the TCE. PPC protection would be emphasized in all environmental education programs required for the project.

SFPP would pay into a mitigation bank as directed by the USFWS. The amount paid into the mitigation bank will be based on a loss of habitat of a 6 mile (approximate length of known habitat) by 4 foot (with of trench area) area; or 2.9 acres. This would compensate for the portion of the TCE that will not likely support PPC in the future due to the altered surface hydrology of the trench area. SFPP would separate and replace top soil within the TCE in patches of occupied PPC habitat. USFWS will identify a qualified botanist to salvage unavoidable plants.

Desert tortoise. The Proposed Action would not likely affect the desert tortoise, either directly or indirectly. If a tortoise is encountered in the project area during construction, work in the area would cease until the tortoise could be moved out of harms way by a qualified handler. A potential indirect effect would be the loss of foraging habitat; however, this impact would be minimal considering the amount of similar habitat surrounding the proposed project area.

Cactus ferruginous pygmy-owl—The Proposed Action would not affect this species or its habitat. Current information indicates that this species no longer occupies the project area or vicinity.

Western burrowing owl. The Proposed Action may affect burrowing owls and their habitat. Because burrowing owls are year-round residents to the area, there is a potential for impact. The Proposed Action may have an indirect effect on nearby burrowing owls

during construction activities. This potential impact would be minimal, lasting only during the construction activities within the TCE. After completion of pipe installation, the TCE would experience minimal maintenance activities.

A clearance survey for burrowing owls of proposed project areas would be conducted within 30 days prior to initiation of construction activities. If burrowing owls are found, the owls would be evicted prior to the start of construction. If eviction of owls during the breeding season is necessary, the project proponent would coordinate with the USFWS and AGFD to evict the owls in a manner that minimizes potential harm to adults and nestlings.

Jaguar. No impacts to jaguars from the Proposed Action would be likely given the extremely low probability of a transient individual being present during construction activity. The nearest, source population of transient jaguars is 135 miles south of the international border in Sonora, Mexico.

Lesser long-nosed bat. The Proposed Action would have no direct effects on individual lesser long-nosed bats. There would be no effects on roosts or maternity sites. No saguaros and relatively few agaves, which are major foraging plants, would be removed.

Cave myotis. The Proposed Action would have no effect on cave myotis' roost or maternity sites. The Proposed Action may have an indirect effect on individuals foraging behavior during construction. However, this potential impact would be minimal considering the amount of similar habitat surrounding the project area. The species insect prey base would not be affected.

Fringed myotis. The Proposed Action would have no effect on the fringed myotis' roost or maternity sites. The Proposed Action may have an indirect effect on individuals foraging in the area during construction. However, this potential impact would be minimal considering the amount of similar habitat surrounding the project area. The species insect prey base would not be affected.

Mexican long-nosed bat. The Proposed Action would have no effect on the Mexican long-tongued bats' roost or maternity sites. Saguaros, which are major foraging plants, would not be removed, and would remain physically available to the bats. The Proposed Action may have an indirect effect on foraging behavior of individuals potentially foraging in the area during construction. This potential impact would be minimal considering the amount of similar habitat surrounding the project area.

Mexican long-tongued bat. The Proposed Action would have no effect on the Mexican long-nosed bats' roosts or maternity sites. The Proposed Action may have an indirect effect on foraging behavior of individuals during construction. This potential impact would be minimal considering the amount of similar habitat surrounding the project area.

Western small-footed myotis. The Proposed Action would have no effects on the western small-footed myotis' roosts or maternity sites. The Proposed Action may have an indirect effect on individuals foraging behavior during construction. This potential impact would be minimal considering the amount of similar habitat surrounding the proposed project area. The species insect prey base would not be affected.

California leaf-nosed bat. The Proposed Action would have no effects on the California leaf-nosed bats' roosts or maternity sites. The Proposed Action may have an indirect effect

on individuals foraging in the area during construction. This potential impact would be minimal considering the amount of foraging area and suitable vegetation available in the area surrounding the proposed project. The species insect prey base would be unaffected.

3.9.2.5 Ancillary Facilities

Ancillary facilities proposed to be constructed or modified would have no affect on any special status species or its habitat.

3.9.2.6 No Action Alternative

Under the No Action alternative, no ground disturbing activities would occur and habitat within the proposed project areas would remain in their current state. The No Action alternative would have no immediate affect on special status species. No mitigation would be required. However, continued aging of the existing pipeline could lead to increased maintenance activities. Such activities could be in emergency situations, which could lead to unforeseen impacts to special status species.

3.10 Air Quality

The U.S. Environmental Protection Agency (USEPA) sets air quality standards as a mechanism for attaining air quality levels that protect public health and the environment. These standards are based on scientific determinations of thresholds below which no adverse effects on human health or the environment may occur. The current National Ambient Air Quality Standards (NAAQS) have been established for six criteria pollutants: carbon monoxide, nitrogen dioxide, lead, ozone, sulfur dioxide, and two sizes of particulate matter (PM). States are required to adopt ambient air quality standards that are at least as stringent as the federal NAAQS; however, state standards may be more stringent. Areas of the country where air pollution levels consistently exceed the NAAQS may be designated "nonattainment." The following section provides the nonattainment area specifications for Segments A through C.

3.10.1 Affected Environment

3.10.1.1 Segment A

Segment A is located entirely in El Paso County in the State of Texas. El Paso County is designated as nonattainment for PM_{10}. Portions of the county also are designated nonattainment for carbon monoxide. El Paso County is designated attainment for all other pollutants by USEPA and the State of Texas. Segment A would be located in the nonattainment area for PM_{10}. Portion of Segment A would be located in non-attainment area for CO. standard.

3.10.1.2 Segment B

Segment B is located in El Paso and Dona Ana counties of Texas and New Mexico.

Segment B is located in non-attainment area for PM10 in El Paso County. Portions of Dona Ana County are designated nonattainment for PM_{10} and ozone.

3.10.1.3 Segment C

Segment C passes through Cochise and Pima counties of Arizona. Portions of Pima and Cochise counties are designated nonattainment for PM_{10} and sulfur dioxide.

There has been no violation of ambient air quality standards for SO2 standards in both counties for several years. The primary sources of Sulfur dioxide in Pima and Cochise counties were the Phelps Dodge, Inc. copper smelters, which have been dismantled. ADEQ submitted to EPA request for redesignation to attainment for sulfur dioxide.

Similarly, there have been no violations of PM_{10} standards in both counties for several years. ADEQ has submitted or is in process of development of request for redesignation of attainment for PM_{10} in both counties.

3.10.1.4 Ancillary Facilities

El Paso Breakout Station

A refined petroleum products storage facility & pumping station is currently under construction; located at 11621 Rail Road Drive in El Paso, Texas. The existing facilities at the Breakout Station are regulated by TCEQ Air Preconstruction Permit No. 72999. The facility is scheduled to begin operation second quarter of 2006. The major upgrades at this facility include installation of two new 2,000 hp pumps, 16" pig launcher, control valve, surge pump and upgrades to existing pumps.

Installation of new pumps will require amendments to the existing air permit. SFPP would apply for amendment of the air quality permit as required by the Texas Administrative Code Chapter 116 (30 TAC Chapter 116). There is no school within 3,000 feet of the property and no developed housing within 50 feet of the property. The nearest school to the proposed site is Desertaire Elementary School at 6301 Tyger Eye Drive, approximately 10,500 feet from the property. The nearest housing to the proposed site is on Roadrunner Street, located approximately 5,870 feet to the southwest of the proposed site.

Tucson Terminal

The Tucson Terminal is an existing terminal & pumping station located at 3841 E. Refinery Way in the City of Tucson, Arizona in Pima County. This facility is currently being upgraded as part of the East Line Expansion Project. As part of the EPX Project, the major upgrades to the inbound system at this facility include the installation of: A new 16" pig receiver and inbound piping, control valve, relief valves, meter & prover, jet fuel filters, distribution manifold & sub manifolds and upsized tank lines. The outbound system would be upgraded by installing: a new 3,000 HP shipping pump and motor and new control valve. In addition, three new 60,000 barrel breakout tanks would be installed at the Tucson Terminal. These modifications at the Tucson terminal would require revision to pending Title V permit for the facility.

Pump Stations and Terminals

There are five pump stations and terminals along the existing East Line pipeline system: El Paso Station, El Paso Breakout Station, Deming Station, Tucson Station/Terminal, and Phoenix Terminal. The pumps utilized at each of the pump stations are electrically driven. Minimal air quality impact is expected at these pump stations. Insignificant amount of

volatile organic compounds would be emitted from flanges connectors and pump seals at these sites.

3.10.2 Environmental Consequences

3.10.2.1 Proposed Action

The proposed project is located in a Class II airshed. Under the Clean Air Act (CAA), Class II areas have increment ceilings on additional pollution over baseline concentrations, which allow for moderate development. Class II airsheds represent areas of the country protected under the CAA, however, with less stringent protection from air pollution damage than Class I or other exceptions. Class I airsheds are identified by the CAA as areas that were in existence as of August 7, 1977, that meet the following criteria: national parks over 6,000 acres, national wilderness areas and national memorial parks over 5,000 acres, and international parks.

Air quality for the entire project area would be degraded only during short-term construction activities and during limited operation of backup generators at ancillary facilities. During groundbreaking activities for pipe installation, an increase in vehicular traffic and fugitive dust would be expected. An increase in emissions from construction equipment and vehicles transporting employees and materials to the work site also would occur during the construction phase. However, emission levels of volatile organic compounds (VOCs), nitrogen oxides, sulfur dioxide, carbon monoxide, and other emissions from internal combustion engines and PM_{10} from vehicular travel on unpaved surfaces would not be expected to exceed any predetermined standards for air quality.(BLM, 2001)

In the maintenance phase, little impact on air quality from fugitive dust is anticipated due to the close proximity of the ROW to existing highways, requiring minimal travel on unpaved surfaces. The electric pump stations would not affect air quality under normal conditions. In the event of regular power interruptions, backup generators (255 horsepower [hp]) powered by natural gas or diesel fuel would provide emergency electrical power. It is estimated that each generator would not be required for more than 100 hours per year. During times of operation, these generators would emit some amounts of the six criteria pollutants; however, emissions would not exceed annual air quality general conformity thresholds (BLM, 2001). No mitigation measures for generator use are recommended as no adverse effects would result from their temporary use.

The following mitigation measures would be in place during project construction and/or operation of the pipeline system:

- Construction sites would be sprayed with water, when needed, to reduce suspension of dust particles.
- All portable engines and portable engine-driven equipment would be inspected and maintained pursuant to state or local regulations.

Impacts to air quality for each segment would be negligible and short term. Impacts would primarily take the form of fugitive dust during construction activities. The Proposed Action would not cause the local air quality to exceed the NAAQS.

3.10.2.2 No Action Alternative

Under the No Action Alternative, the current supply of petroleum products would have to satisfy the increasing demands of the Phoenix/Tucson region. The area would continue to receive a large portion of their petroleum products via tanker trucks. Potential environmental impacts associated with hauling petroleum products by tanker trucks would remain. This would include potential impacts to air quality due to high truck traffic associated with tanker trucks hauling to Phoenix and Tucson.

3.11 Historic and Cultural Resources

Cultural resources are locations of past activity, occupation or use, and include archaeological, historic, or architectural sites. A cultural resource is defined as 50 years old or older. Numerous laws and regulations oversee the protection of such cultural resources, including the Antiquities Act of 1906 (PL 59-206), the National Historic Preservation Act of 1966 (as amended, PL 89-665), the National Environmental Policy Act of 1969 (PL 91-852), the Archaeological Resources Protection Act of 1979 (PL 96-95), and the Executive Order 11593.

A Class I archaeological site records search was conducted to gather information on previously recorded sites within a ¼-mile radius of the project area in Texas and New Mexico and 1-mile radius in Arizona. Subsequently, a Class III intensive field inventory was conducted within a 200-foot-wide corridor for the pipeline and access roads. Laydown yards and break down areas also were surveyed. Archaeologists walked non-overlapping transects spaced at no more than 15-meter intervals. Any cultural remains determined to be 50 years or older were recorded. If an area contained a concentration of artifacts or features, the area was recorded as a site according to BLM, Fort Bliss, and the States of Texas, New Mexico, and Arizona's definitions for sites located within their respective jurisdictions. If these definitions did not apply to the located cultural remains, they were recorded as isolated occurrences. During recording of a site, archaeologists analyzed artifacts in the field to determine the age of the site and its cultural affiliation. In addition, National Register of Historic Places (NRHP) eligibility also was assessed for each site.

The goals of the survey were (1) to identify all cultural resources within the area potential effect, (2) to evaluate such resources in terms of eligibility for the National and State Registers of Historic Places (collectively referred to as the Register), and (3) to assess the effects of the proposed undertaking on such resources. Historic context, historic significance, and historic integrity are the three interrelated concepts on which eligibility is based. ("Historic", in this sense, applies to both prehistoric and historic-period cultural resources.) The significance of a cultural resource (historic property) depends upon its association with an important historic context and upon retaining the integrity of those features necessary to convey its significance.

- Historic contexts are defined as "those patterns, themes, or trends in history by which a specific occurrence or property is understood and its meaning (and ultimately its significance) within history is made clear" (National Register Staff, 1998:7). For archaeological sites, the historic context is "the analytical framework within which a property's importance can be understood" (Townsend et al., 1993:25).

- Historic significance is defined as "the importance of a property to the history, architecture, archaeology, engineering, or culture of a community, state, or the nation" (McClelland, 1997:3). The criteria used to determine significance recognize different types of values embodied in the various types of cultural resources: districts, sites, buildings, structures, and objects. These values fall into one or more categories (National Register Staff, 1998:11):
  - Associative value (Criteria A and B): Cultural resources significant for their association or linkage to events (Criterion A) or persons (Criterion B) important in the past.
  - Design or Construction value (Criterion C): Cultural resources significant as representatives of the manmade expression of culture or technology.
  - Information value (Criterion D): Cultural resources significant for their ability to yield important information about prehistory or history.
- Historic integrity is defined in general as "the authenticity of a property's historic identity, evidenced by the survival of physical characteristics that existed during the property's historic period (McClelland, 1997:4). For archaeological sites significant under Criterion D, the site's importance resides in its potential to answer questions relevant to its historic context. This, in turn, means that its historic integrity is defined by the presence of sufficiently intact archaeological features and deposits (Townsend et al., 1993).

The project archaeologists made NRHP eligibility recommendations to the BLM; the BLM then consulted with the appropriate agencies to determine site eligibility.

3.11.1 Affected Environment

Since the current project crosses a vast extent of the southern Southwest, the project area includes evidence of many cultures. Archaeologists have devised various frameworks to address culture history in the region. Evidence of human occupation in the region where the pipeline segments cross are evident since the Paleoindian period of 10,000 B.C. There are similarities across the region in the Paleoindian and Archaic period, but later prehistory exhibits greater variability.

3.11.2 Segment A and Segment B (Texas portion)

The following describes the cultural resources for Segment A and the Texas portion of Segment B. Segments A and B cultural resources surveys conducted in and within ¼ mile of project area are listed in Table 3.11-1. Table 3.11-2 lists the previously located sites within the same area.

TABLE 3.11-1
Segment A and B (Texas) Cultural Resources Surveys Conducted In and Within ¼ Mile of Project Area

Year	No. of Acres/Miles	Client/Sponsor	Undertaking	Performing Agency/ Consultant	Reference
Segment 1					
1964	Unknown	Unknown	Survey	U.T. Austin	U.T. Austin 1964
1967	Unknown	Unknown	Salvage Project	EPAS	Brook, 1967
1976	Unknown	Ft. Bliss	Maneuver Areas 1 and 2	UTEP	Whalen, 1976
1977	Unknown	Ft. Bliss	Maneuver Areas 1 and 2	UTEP	Whalen, 1977
1978	Unknown	Ft. Bliss	Maneuver Areas 1 and 2	UTEP	Whalen, 1978
1980	Unknown	Ft. Bliss	Maneuver Areas 1 and 2	UTEP	Whalen, 1980
1986	Unknown	TXDOT	Loop 375	UTEP	O'Laughlin et al., 1986
1987	Unknown	TXDOT	Loop 375	UTEP	O'Laughlin et al., 1987
1988	Unknown	TXDOT	Loop 375	UTEP	O'Laughlin et al., 1988
1989	Unknown	TXDOT	Loop 375	UTEP	O'Laughlin et al., 1989
1990	Unknown	TXDOT	Loop 375	UTEP	O'Laughlin et al., 1990
1991	Unknown	TXDOT	Loop 375	UTEP	O'Laughlin et al., 1991
1996	Unknown	Ft. Bliss	Maneuver Areas 1 and 2		Lukowski and Stuart 1996

Notes:
EPAS = El Paso Archaeological Society
U.T. Austin = University of Texas, Austin
UTEP = University of Texas, El Paso
TXDOT = Texas Department of Transportation

TABLE 3.11-2
Segment A Previously Recorded Sites in and Within ¼ Mile of Project Area

Site No.	Site Type/Constituents	Cultural/Temporal Affiliation(s)	Reference
41EP8 (FB	Habitation	Mogollon	U.T. Austin, 1964

TABLE 3.11-2
Segment A Previously Recorded Sites in and Within ¼ Mile of Project Area

Site No.	Site Type/Constituents	Cultural/Temporal Affiliation(s)	Reference
10366)			
41EP319	Artifact scatter	Mogollon	Unknown
41EP1716	Artifact scatter	Mogollon	EPAS, 1985
FB10360	Artifact scatter	Unknown	---
FB10366	Artifact scatter with features	Mogollon	---
FB10367	Artifact scatter	Mogollon	---
FB10368	Artifact scatter	Unknown	---
FB10373	Artifact scatter	Mogollon	---
41EP12 (FB 10537)	Artifact scatter with isolated room	Mogollon	O'Laughlin et al., 1988
41EP902 (FB 7884)	Artifact scatter with hearth	Unknown	---
41EP1672 (FB 6832)	Artifact scatter with features	Mogollon	---
41EP1905 (FB 7954)	Small camps	Mogollon	---
41EP2503	Unknown	Unknown	---
41EP2838 (FB 10038)	Artifact scatter with features	Mogollon	O'Laughlin et al., 1989
41EP4998	Artifact scatter	Mogollon	---
41EP5004	Artifact scatter with hearth	Mogollon	---
41EP5005	Artifact scatter with hearth	Unknown	---
41EP5612	Artifact scatter	Archaic/Mogollon	---
41EP5613	Artifact scatter	Unknown	---
41EP8	Habitation	Mogollon	---
41EP319	Artifact scatter	Mogollon	---
41EP1716	Habitation	Mogollon	---
FB10360*	Artifact scatter	Unknown	---
FB10366*	Artifact scatter with features	Mogollon	---
FB10367*	Artifact scatter	Mogollon	---
FB10368*	Artifact scatter	Unknown	---
FB10373*	Artifact scatter	Mogollon	---
41EP12	Artifact scatter with isolated room	Mogollon	---

TABLE 3.11-2
Segment A Previously Recorded Sites in and Within ¼ Mile of Project Area

Site No.	Site Type/Constituents	Cultural/Temporal Affiliation(s)	Reference
41EP902	Artifact scatter with hearth	Unknown	---
41EP1672	Artifact scatter with features	Mogollon	---
41EP1905	Small camps	Mogollon	---
41EP2503	Unknown	Unknown	---
41EP2838	Artifact scatter with hearth	Unknown	---
41EP4998	Artifact scatter	Mogollon	---
41EP5004	Artifact scatter with hearth	Mogollon	---
41EP5005	Artifact scatter with hearth	Unknown	---
41EP5612	Artifact scatter	Archaic/ Mogollon	---
41EP5613	Artifact scatter	Unknown	---

*Although these sites have Fort Bliss site numbers, they are located outside the current Fort Bliss boundaries.

Archeological sites located within the project corridor for Segment A are listed in the following table for both previously recorded and currently recorded sites that may be impacted by the proposed action. Seven sites occur in Texas, six of which are recommended as NRHP eligible. Treatment recommendations are indicated in Table 3.11-3 for each site. Data recovery would be limited to the areas of potential effect. A monitor will be provided for all ground disturbing activities near and within the boundaries of sites determined eligible for the NRHP and for other areas determined to have a high potential for buried cultural deposits.

TABLE 3.11-3
Archaeological Sites in Texas: Current NRHP Eligibility and Treatment Recommendations

Site No.	Cultural/ Temporal Affiliation	Site Type	Eligibility	Approx. Size	Reason for Eligibility	Avoidance Option	Treatment
41EP8 (FB 10366)	Jornada Mogollon	Habitation	Eligible	130, 000 m²	Roomblock site; Potential for additional information to address research questions in the area.	No	Data recovery
41EP5798 (FB 16661)	Jornada Mogollon	Artifact scatter	Not eligible	5, 500 m²	Site lacks potential for yielding quality data for addressing research questions in the area.	No	None

TABLE 3.11-3
Archaeological Sites in Texas: Current NRHP Eligibility and Treatment Recommendations

Site No.	Cultural/ Temporal Affiliation	Site Type	Eligibility	Approx. Size	Reason for Eligibility	Avoidance Option	Treatment
41EP5799 (FB 16663)	Jornada Mogollon	Artifact scatter with feature	Eligible	1, 333 m²	Potential for additional information to address research questions in the area.	No	Data recovery
41EP5800 (FB 17090)	Jornada Mogollon	Artifact scatter with features	Eligible	11, 200 m²	Radiocarbon; potential for additional information to address research questions in the area.	No	Data recovery
41EP5612 (FB 12353)	Archaic/ Mogollon	Artifact scatter	Eligible	156 m²	Potential for additional information to address research questions in the area.	No	Data recovery
41EP5801 (FB 17091)	Jornada Mogollon	Artifact scatter	Eligible	900 m²	Radiocarbon; potential for additional information to address research questions in the area.	No	Data recovery
49194-T3	on	Artifact scatter	Eligible	4, 550 m²	Potential for additional information to address research questions in the area.	No	Data recovery
41EP5596	Jornada Mogollon	Artifact scatter with feature	Not Eligible	37 x 34 m	Potential largely exhausted.	No	None
41EP5795	Jornada Mogollon	Artifact scatter with features	Eligible	84 x 49 m	Potential for additional information to address research questions in the area.	No	Data recovery
41EP5796	Euro-American / Hispanic	Ranching and Farming	Eligible	700 x 600 m	Potential for additional information to address research questions in the area.	No	Archival research
Note: m^2 = square meter.							

3.11.3 Segment B (New Mexico Portion)

Segment B cultural resources surveys conducted in the New Mexico portion within 1 mile of project area are listed in Table 3.11-4. Table 3.11-5 lists the previously located sites within the same area.

TABLE 3.11-4
Segment B Cultural Resources Surveys Conducted In and Within ¼ Mile of Project Area (New Mexico Portion)

Year	No. of Acres/Miles	Client/Sponsor	Undertaking	Performing Agency/ Consultant	Reference
Segment B (New Mexico Portion)					
1980-1982	3236.0	Unknown	Survey for Research Design	New Mexico State University – Cultural Resource Management Division	Duran 1982a
1985	1.84	El Paso Electric	Powerline to Pumping Station	New Mexico State University – Cultural Resource Management Division	Holsten et al. 1985
1979	236.36	Western Geophysical	Seismic Testing	Eastern New Mexico University Agency for Conservation Archaeology	MacLennan and Richards 1979
1980	4799.25	Petty-Ray Geophysical	Geothermal Testing	New Mexico State University – Cultural Resource Management Division	Taylor and Brethauer 1980
1980	64.33	Mtn. Bell	Buried Telephone Cable	New Mexico State University – Cultural Resource Management Division	Kirkpatrick 1980
1978	487.24	Exxon	Seismographic Testing	New Mexico State University – Cultural Resource Management Division	Weyer 1978
1982	219.4	NMSHTD	SR404	NMSHTD	Koczan 1982
1986	2080.0	Dames & Moore	US Telecom Fiber Optic	Human Systems Research	Kirkpatrick and Hart 1986 Hart, et al. 1997
1987	11.16	Mtn. Bell	Buried Cable	Human Systems Research	Kirkpatrick 1987

TABLE 3.11-4
Segment B Cultural Resources Surveys Conducted In and Within ¼ Mile of Project Area (New Mexico Portion)

Year	No. of Acres/Miles	Client/Sponsor	Undertaking	Performing Agency/ Consultant	Reference
1983-1989	Not entered	All-American Pipeline	Pipeline	New Mexico State University – Cultural Resource Management Division	Ackerly et al. 1989
1987	127.7	Mtn. Bell	Telephone Line	Human Systems Research	Clifton 1987
1988	4.0	El Paso Electric	Electric Line Tap	Batcho & Kauffman	Powder and Stewart 1988
1979-1980	10829.06	Dona Ana Cty. Public Works Dept.	Gravel Pits	New Mexico State University – Cultural Resource Management Division	Heinsch 1980
1990	6.0	El Paso Electric	Electric Line	Batcho & Kauffman	Stuart 1990
1989-1900	N/A	Historic Preservation Division	Herbert Yeo Collection Project	Human Systems Research	Duran and Ayer 1990
1990	50.8	Dona Ana Cty. Public Works Dept.	Gravel Pits	New Mexico State University – Cultural Resource Management Division	Slensker et al. 1990
1990	130.0	Dona Ana Cty. Flood Commission	Lauson Arroyo Dam	Don Clifton	Clifton 1990
1988-1993	9516	BLM	Cox Ranch Land Exchange	UNM- Office of Contract Archaeology	Hogan 1993
1991	97.0	NMSHTD	Frontage Road between NM404 & Vado	NMSHTD	Haecker 1991
1992	2.78	Santa Fe Pacific Pipeline	Anode Replacement	Batcho & Kauffman	Kauffman 1992
1992	26.15	C.S. McCrossan Construction	Borrow Pits	Laura Michalik	Michalik 1992
1991	223.6	Gas Co. of NM	Gas Pipeline	Laura Michalik	Michalik 1991
1992	91.75	City of Las Cruces	Pipeline	New Mexico State University – Cultural Resource Management Division	Ackerly et al. 1992
1993	20.6	EPNG	Pipeline	Human Systems Research	Sechrist 1993

TABLE 3.11-4
Segment B Cultural Resources Surveys Conducted In and Within ¼ Mile of Project Area (New Mexico Portion)

Year	No. of Acres/Miles	Client/Sponsor	Undertaking	Performing Agency/ Consultant	Reference
1993-1994	177.85	NMSHTD	NM213 Maintenance	NMSHTD	Evans1994
1994	11.82	El Paso Electric	Electric Line	Batcho & Kauffman	Stuart 1994
1994	50.0	Molsen- Corbin	Water System Improvement	Archaeo- Assoc. Ltd.	McNew and Brown 1994
1994	1.37	EPNG	Meter Station	Human Systems Research	McNew 1994
1955	Not entered	Southern Pacific Pipeline	Pipeline	National Park Service	Ingmanson 1955
1982	28.47	NM Energy Institute	Geothermal Well Pads	New Mexico State University – Cultural Resource Management Division	Duran 1982b
1995	345.0	El Paso Electric	345 KV Line Transmission	John Wilson	Wilson 1995
1994-1995	601.6	JHK Assoc. Inc.	NM 478	SWCA	Zyniecki and Phillips1995
1987-1995	Not entered	Pacific-Texas	Pipeline	Prewitt and Associates	Boyd 1995
1997	2.5	Trebor Group	Well Location	Laura Michalik	Michalik 1997
1997	614.54	El Paso Electric	Power Lines	University of Texas El Paso	Lukowski and Mbutu 1997
1999	2.38	El Paso Electric	Electric Lines	Laura Michalik	Michalik 1999
1999-2000	989.01	CH2MHILL	Las Cruces Water Project	Geo-Marine	Gibbs et al. 2000
1999-2000	2615.0	El Paso Energy	Fiber Optic	SWCA	Wase et al., 2000
1999	253.6	BLM	Mountain Bike Trail	Matthews Archaeology	Matthews 1999
2000-2001	1873.2	EPNG	Natural Gas Pipeline	SWCA	Wase et al., 2001
2000-2001	4416	World Wide Inc.	Fiber Optic	TRC	Railey and Yost 2001
2001	40.0	S Central Council and Governors	Industrial Park	Laura Michalik	Michalik 2001
2001	43.2	Conoco	Pipeline	Mesa Field Services	Michalik 2002
2001	8.47	Qwest Communications	Fiber Optic	Lone Mountain Archaeological Services	Mayberry and Travis 2001

TABLE 3.11-4
Segment B Cultural Resources Surveys Conducted In and Within ¼ Mile of Project Area (New Mexico Portion)

Year	No. of Acres/Miles	Client/Sponsor	Undertaking	Performing Agency/ Consultant	Reference
2002	137.2	Dona Ana Cty.	Wastewater Lines	Taschek	Raymond and Sullins 2002
2002	46.0	EPNG	Pipeline Replacement	Metcalf Archaeological Consultants	Metcalf 2002
2003	15.0	ENTRIX Inc.	Pipeline	Human Systems Research	Kirkpatrick 2003
2003	46.5	BLM	Parking Lots	Bureau of Land Management	Thacker 2003
2003	25.0	Bohannan - Huston	Water System Improvements	Zia Engineering and Environ. Consulting	Bisson and Martinez 2003
2004-2005	3631.7	SFPP	Pipeline	TRC	Goar et.al. 2005
2005	3.44	Meridian Contracting LLC	Materials Pit	Laura Michalik	Michalik 2005

TABLE 3.11-5
Segment B Previously Recorded Sites in and Within ¼ Mile of Project Area (New Mexico Portion)

Site No.	Site Type/Constituents	Cultural/Temporal Affiliation(s)	Reference
LA 1643	Artifact Scatter	Mogollon	Duran and Ayer 1990
LA 1667	Artifact Scatter	Mogollon	Duran and Ayer 1990
LA 2900	Artifact Scatter with Thermal Features	Mogollon	Ackerly et al. 1989
LA 5957	Artifact Scatter	Unknown	Ingmanson 1955
LA 8856	Artifact Scatter with Hearth	Mogollon	Duran and Ayer 1990
LA 16467	Artifact Scatter with Hearths	Mogollon	Weyer 1978
LA 16468	Artifact Scatter with Hearths	Paleoindian, Mogollon	Ackerly et al. 1989
LA 20032	Artifact Scatter with Hearth	Unknown	MacLennan and Richards 1979
LA 20033	Artifact Scatter with Hearth	Unknown	MacLennan and Richards 1979
LA 26972	Artifact Scatter	Archaic, Mogollon	Heinsch 1980
LA 27738	Artifact Scatter with Hearths	Mogollon	Taylor and Bretauer 1980
LA 35326	Artifact Scatter with Hearth	Unknown Prehistoric, Unknown Historic	Duran 1982a
LA 43233	Artifact Scatter with Feature	Archaic	Koczan 1982

TABLE 3.11-5
Segment B Previously Recorded Sites in and Within ¼ Mile of Project Area (New Mexico Portion)

Site No.	Site Type/Constituents	Cultural/Temporal Affiliation(s)	Reference
LA 43234	Artifact Scatter with Hearths	Mogollon	Koczan 1982
LA 53992	Artifacts Scatter with Hearths and other Features	Mogollon	Holsten et al. 1985
LA 55787	Midden	Unknown, Unknown	Ackerly et al. 1989
LA 55788	Midden	Unknown	Ackerly et al. 1989
LA 55789	Artifact Scatter	Unknown	Ackerly et al. 1989
LA 55790	Artifact Scatter	Unknown	Ackerly et al. 1989
LA 55791	Artifact Scatter	Unknown	Ackerly et al. 1989
LA 55792	Artifact Scatter	Unknown	Ackerly et al. 1989
LA 55794	Artifact Scatter	Mogollon	Ackerly et al. 1989
LA 66082	Artifact Scatter with Hearths	Mogollon	Boyd 1995
LA 66083	Artifact Scatter with Hearths	Unknown, Mogollon	Boyd 1995
LA 66086	Artifact Scatter	Mogollon	Boyd 1995
LA 66088	Artifact Scatter with Hearths	Mogollon	Stuart 1994
LA 66188	Artifact Scatter with FCR	Unknown	Clifton 1987
LA 67709	Artifact Scatter	Unknown	Hogan 1993
LA 67710	Artifact Scatter	Unknown	Hogan 1993
LA 67711	Artifact Scatter with Ash Stain	Unknown	Hogan 1993
LA 69105	Artifact Scatter with FRC	Unknown	Powder and Stewart 1988
LA 82892	Artifact Scatter with Hearths	Unknown	Clifton 1990
LA 98662	Artifact Scatter with Features	Mogollon	Ackerly et al. 1992
LA 98663	Artifact Scatter	Anglo/Euro-American	Ackerly et al. 1992
LA 99722	Artifact Scatter with Charcoal	Mogollon	Kauffman 1992
LA 100321	Artifact Scatter with Hearths	Archaic, Mogollon	Sechrist 1993
LA 108984	Artifact Scatter with Hearth	Unknown	Wilson 1995
LA 120435	Hearth	Unknown	Lukowski and Mbutu 1997
LA 120436	Artifact Scatter with Hearth	Unknown	Lukowski and Mbutu 1997
LA 127219	Artifact Scatter	Unknown	Gibbs et al. 2000
LA 128634	Artifact Scatter with Hearths	Archaic, Mogollon, Anglo/Euro-American	Wase et al. 2000
LA 128635	Artifact Scatter with Hearths	Unknown	Wase et al. 2000
LA 128636	Artifact Scatter with Hearth	Mogollon	Wase et al. 2000

TABLE 3.11-5
Segment B Previously Recorded Sites in and Within ¼ Mile of Project Area (New Mexico Portion)

Site No.	Site Type/Constituents	Cultural/Temporal Affiliation(s)	Reference
LA 129236	Habitation	Anglo/Euro-American	Gibbs et al. 2000
LA 130262	Artifact Scatter	Mogollon	Wase et al. 2000
LA 131158	Artifact Scatter with Feature	Unknown	Railey and Yost 2001
LA 144264	Artifact Scatter with Feature	Unknown	Goar et al. 2005
LA 145137	Artifact Scatter with Feature	Mogollon	Goar et al. 2005
LA 146973	Artifact Scatter	Anglo/Euro-American	Goar et al. 2005

Table 3.11-6 presents NRHP eligibility and treatment recommendation for both previously recorded and currently recorded sites in Segment B that may be impacted by the proposed action. Five of these sites were recommended as NRHP eligible. A monitor will be provided for all ground disturbing activities near and within the boundaries of sites determined eligible for the NRHP and for other areas determined to have a high potential for buried cultural deposits.

TABLE 3.11-6
Segment B Archaeological Sites in New Mexico: NRHP Eligibility and Treatment Recommendations

Site Number	Land Status	Site Type	Cultural/ Temporal Affiliation	Approximate Size	Preliminary Assessment	Justification	Avoidance Option	Treatment
LA 66083	BLM	Artifact scatter with features	Jornada Mogollon	403 x 217	Eligible under D	Subsurface cultural remains	N/A	Data recovery within the survey corridor
LA 66088	BLM	Artifact scatter with features	Jornada Mogollon	28 x 69	Not eligible	Lacks integrity, most of site gone	N/A	None
LA 144264	BLM	Artifact scatter with feature	Unknown	35 x 7	Not eligible	No indication of subsurface cultural remains on the surface	N/A	None
LA 152764	NM State Trust	Artifact scatter	Unknown	39 x 36	Not eligible	No indication of subsurface cultural remains on the surface	N/A	None
LA 152765	NM State Trust	Artifact scatter	Unknown	63 x 41	Not eligible	No indication of subsurface cultural remains on the surface	N/A	None
LA 1643	Private	Artifact scatter	Jornada Mogollon	90 x 45	Eligible under D	Artifacts found only in eroded areas or blowouts. Deep aeolian sands surround this site.	Will be avoided if preferred Route is chosen (on Alternate Route)	Data recovery within the survey corridor

TABLE 3.11-6
Segment B Archaeological Sites in New Mexico: NRHP Eligibility and Treatment Recommendations

Site Number	Land Status	Site Type	Cultural/ Temporal Affiliation	Approximate Size	Preliminary Assessment	Justification	Avoidance Option	Treatment
LA 55789	Private	Artifact scatter	Jornada Mogollon	169 x 37	Not eligible	No indication of subsurface cultural remains on the surface, most of site gone	N/A	None
LA 128634	BLM	Artifact scatter with features	Archaic, Mogollon, Euroamerican	180 x 89	Eligible under D by SHPO	Subsurface cultural remains, large artifact assemblage.	N/A	Data recovery within the survey corridor.
LA 100321	BLM	Artifact scatter with features	Archaic, Mogollon	221 x 129	Eligible under D by SHPO	Subsurface cultural remains, large artifact assemblage.	N/A	Data recovery within the survey corridor.
LA 152767	BLM	Rock shelter	Mogollon, Euroamerican	93 x 70	Eligible under D by SHPO	Subsurface cultural remains	N/A	Data recovery within the survey corridor.
LA 98662	BLM	Artifact scatter with features	Archaic / Jornada Mogollon	120 x 78 m	Eligible	Subsurface cultural remains	N/A	Data recovery
LA 99722	BLM	Artifact scatter with charcoal	Jornada Mogollon	90 x 60 m	Eligible under D	Subsurface cultural remains	N/A	Data recovery
LA 153638	BLM	Artifact scatter with features	Jornada Mogollon	150 x 96 m	Eligible under D	Subsurface cultural remains	N/A	Data recovery
LA 128636	BLM	Artifact scatter with hearth	Jornada Mogollon	17 x 66 m	Eligible under D	Subsurface cultural remains	N/A	Data recovery
LA 153639	Private	Features	Unknown	50 x 30 m	Not Eligible	Subsurface deposits unlikely, information potential exhausted	N/A	None
LA 152766	BLM	Artifact scatter	Unknown	186 x 102	Not Eligible	Evidence of subsurface cultural remains on the surface	N/A	None
EBID Ditch Crossings	Private	Irrigation Ditches	Euroamerican/Hispanic	N/A	Listed on the NRHP and SRCP	Part of an historic irrigation district that influenced the growth of Southern New Mexico	N/A	Bore under ditches within the APE

3.11.4 Segment C

In Arizona, the undertaking consists of constructing (1) a 4.7-mile 69 kV power line for a new pump station at San Simon and (2) Segment C, approximately 98 miles of 16-inch pipeline.

Tables 3.11-7 and 3.11-8 present the prefield Class I inventory of cultural resources surveys and previously recorded sites that was conducted for Segment C. Existing data were compiled from the files at the Arizona State Historic Preservation Office (SHPO) and the Arizona State Museum (ASM) Archaeological Records Office, and from the AZSITE Database. Additional sources of information were the ASM Archives, the ASM Library, the

University of Arizona Library Special Collections, the Arizona State Historical Society Library, and the BLM General Land Office (GLO) Records Database. Copies of GLO plats were obtained from the BLM Public Lands Information Center; historic USGS 15-minute and other maps were consulted in the University of Arizona Library map collection.

The records show that 240 cultural resources surveys have been conducted within 1 mile of the proposed pipeline alignment (Table 3.11-10). The Arizona portion of the existing SFPP 8-inch pipeline route was first surveyed in 1955, prior to line's original construction by the SP (McConville and Holzkamper 1955). SWCA's 2000 fiber optic survey along El Paso Natural Gas Line 1103 paralleled much of Segment C (Tucker 2000). Other large-scale linear projects that paralleled portions of Segment C were the AEPCO surveys conducted by the ASM in the 1970s (Simpson et al. 1979; Walker and Polk 1973; Westfall et al. 1979) and WCRM's 2000 NexGen/AT&T survey (Kearns et al. 2001).

Table 3.11-7. Cultural Resources Surveys Conducted Within 1 Mile of Project Area.

Date	No. of Acres/Miles	Client/Sponsor	Undertaking	Performing Agency/ Consultant	Reference
1955	275 miles	SP	Pipeline	ASM	McConville and Holzkamper 1955
1970	30 acres	ADOT	Borrow pit	ASM	Hammack 1970
1973	18 miles	TEP	Power line	ASM	Ayres 1973
1973	--	AEPCO	Power line	ASM	Walker and Polk 1973
1977	56 miles	AEPCO	Power line	ASM	Westfall et al. 1979; Simpson et al. 1979
1978		ADOT	Road work	ADOT	Duering 1978
1979	545 acres	BLMSFO	Seismic lines	ASM	Mallouf and Brew 1980
1979	1 mile	Collins & Assoc.	Sewer	ASM	Huckell and Brew 1979
1980	3.5 miles	Davidson Geographical	Road work	ASM	Wilk and Brew 1980
1980	3.7 miles	JHK & Assoc.	Transportation corridor	ASM	Rozen 1980
1980	480 acres	Miller Paving	Road work	ASM	Madsen 1980
1980	20 miles	Brick Lewis Engineering	Interceptor	ASM	Adams et al. 1980
1981	13 acres	BLMSFO	Mining permit	BLMSFO	Selle 1981a
1981	1 acre	BLMSFO	Power line	BLMSFO	Selle 1981b
1981	15 acres	--	Cable	ASM	Madsen 1981a
1981	79.39 acres	B&R Materials	State land permit	ASM	Madsen 1981b
1982	30 acres	Pima County DOT	State land permit	ASM	Madsen 1982

Date	No. of Acres/Miles	Client/Sponsor	Undertaking	Performing Agency/ Consultant	Reference
1982	56.5 miles	Petty-Ray Geophysical	Seismic lines	Powers	Frampton and Parry 1982
1982	968 acres	WAAP	Power line	CASA	Hammack 1983
1983	11 acres	ADOT	Road work	ADOT	Rosenberg 1981
1983	73.4 acres	SAGO	Development	ASM	Dart 1983
1983	3.8 acres	ADOT	Well, pipeline	ADOT	Rosenberg 1983
1983	173.36 acres	HNTB Architects & Engineers	Detention basin	ASM	Perrine 1983b
1983	10 acres	Telecom Engineers/ Times Mirror	Radio tower	ASM	Lange 1983a
1983	1 acre	Pima County Flood Control	Road work	ASM	Lange 1983b
1983	3.5 miles	Marum & Marum	Interceptor route	ASM	Perrine 1983a
1984	24 acres	Pima County DOT	Development	ASM	Madsen and Fish 1984
1984	--	Red Mt. Mining	Mill	ASM	Madsen 1984
1984	20 acres	BLMSFO	Mining permit	BLMSFO	Kinkade 1984
1984	0.02 acres	TEP	Power line	ASM	Sullivan 1984
1985	32,640 acres	Amerind	Research	Amerind	Woosley and Kriebel 1985
1985	10 acres	SLS	Borrow pit	ASM	Madsen 1985a
1985	8.2 acres	Coates Field/ AT&T	Cable	ACS	Effland 1985
1985	1.0 acre	ASM	Ditch	ASM	Madsen 1985b
1985-86	115 miles	AEPCO	Power line	MNA	Dosh and Stebbins 1985; Dosh et al. 1987
1986	3 miles	Leon Oedekoren	Fence	ASM	Rozen 1986a
1986	180 acres	Cella Barr Assoc.	Development	IFAR	Mayro 1987b
1986	0.55 acres	SSVEC	Power line	ASM	Rozen 1986b
1986-87	862 acres	U.S. Telecom	Cable	DMI	O'Brien et al. 1987
1987	4600 acres	Estes	--	P.A.S.T.	Douglas 1987a
1987	0.79 acres	APS	Power line	ACS	Hackbarth and Macnider 1987
1987	2.47 acres	Pima County DOT	Bridge	IFAR	Mayro 1987a
1987	5 miles	Camp Dresser & McKee	Pipeline	ASM	Euler 1987
1987	4675 acres	USACOE/ Davis-Monthan	Sec. 110 inventory	SRI	Altschul 1987
1987	0.96 acres	Charles Day	Road work	ASM	Madsen 1987
1988	15 acres	SLS-Taylor Lease	Development	ASM	Rozen 1988
1988	25 acres	Vail School District	State land exchange	SWCA	Gregory 1988
1988	57 acres	ADOT	Borrow pit	ARS	Curtis 1988

Date	No. of Acres/Miles	Client/Sponsor	Undertaking	Performing Agency/ Consultant	Reference
1988	542 acres	MCI	Cable	DMI	Bruder et al. 1988
1988	83.5 acres	SP	--	ASM	Bayman 1988
1988-1989	810 acres	Jones & Assoc.	--	P.A.S.T.	Stephen 1989
1989	4.5 acres	BOR	Sensor	BOR	Laush 1989
1989	18.6 acres	BLMSFO	Mining permit	BLMSFO	McQuestion 1989
1990	80 acres	Pima County DOT	Road work	SRI	Harry 1990
1990	5 acres	BLMSFO	--	BLMSFO	Kinkade 1990
1990	26 miles	U.S. West	Cable	SWCA	Slaughter 1990
1990	0.37 acre	Trimble Engineering	Development	C&ES	Slawson 1990
1991	26 miles	U S West	Cable	SWCA	Seymour 1991b
1991	3.91 acres	Camp Dresser & McKee	--	C&ES	Slawson 1991
1991	3150'	City of Tucson	Water line	DAI	Eppley 1991
1991	21.8 acres	U S West	Cable	ACS	Adams 1991
1991	9.5 miles	U S West	Cable	SWCA	Seymour 1991a
1991	230 acres	Coffman Assoc.	Airport	ACS	Stone 1991
1991-92	16.36 miles	ADOT	Road work	ARS	Hathaway and Stone 1992
1992	505 acres	AEPCO	Slurry pond	SWCA	Philips 1992
1992	8.7 miles	City of Benson	Power line	C&ES	Heuett 1992a
1992	177 acres	ADOT	Road work	ARS	Wright 1992a
1992	5.5 acres	U S West	Cable	Tierra	Roth 1992
1992	1.7 acres	Cochise County	Material storage	Tierra	Scott 1992a
1992	5.3 acres	EPNG	Gas line	ACS	Kisselburg 1992
1992	24 miles	ADOT	Road work	ARS	Wright 1992b
1993	640 acres	AEPCO	Land exchange	SWCA	Bierer 1993
1993	3.5 acres	Acorn Assoc.	Development	C&ES	Slawson 1993c
1993	1.1 acres	EPNG	Borrow pit	ACS	Crownover 1993
1993	175 acres	ADOT	Road work	SWCA	Roberts 1993
1993	5.74 acres	EPNG	Cathodic station	ACS	DeMaagd 1993
1993	100 acres	Pima County DOT	Park	C&ES	Slawson 1993a
1993	10 acres	Acorn Assoc.	Development	C&ES	Slawson 1993b
1994	0.17 miles	SSVEC	Power line	C&ES	Heuett 1994
1994	10 acres	City of Tucson	Mainten. facility	DAI	Freeman 1994b
1994	120 acres	BLMSFO	Watershed rehab.	BLM	Botsford 1994b
1994	3 miles	EPNG	Pipeline	ARS	Jensen 1993
1994	2.5 acres	SAGO	Sidewalk	C&ES	Sullivan 1994
1994	628 acres	City of Tucson	Landfill	DAI	Freeman 1994a
1994	8 miles	--	Cable	LMAS	Seymour and Orozco 1994

Date	No. of Acres/Miles	Client/Sponsor	Undertaking	Performing Agency/ Consultant	Reference
1994	1.04 acres	BLMSFO	Watershed rehab.	BLMSFO	Botsford 1994a
1994	9.7 acres	ADOT	Road work	ARS	Stone 1994
1995	36 acres	James Driscoll	Development	OPAC	Lenhart 1995
1995	280'	SSVEC	Power line	C&ES	Heuett 1995
1995	0.98 acres	GRP & Assoc.	Development	Aztlan	Slawson 1995
1995	1910 acres	AEPCO	Power line	SWCA	Philips 1996
1995	1.43 acres	Kennecot	Access road	DAI	Linderman 1995
1995	4.47 acres	TEP	Power line	P.A.S.T.	Stephen 1995
1995	14.6 acres	City of Tucson	Water main	DAI	Freeman 1995
1996	337 acres	ADOT	Road work	ARS	Kwiatowski 1996
1996	1 acre	City of Tucson	Road work	DAI	Eppley 1996
1996	0.8 acres	Phelps Dodge	Mining	SWCA	Doak 1996
1996	1.99 acres	Sun Mechanical	Development	OPAC	Dart 1996
1996	0.1 mile	IXC Carrier	Power line	P.A.S.T.	Stephen 1996b
1996	5.74 acres	EPNG	Cathodic station	ACS	Punzmann 1996b
1996	5.294 acres	Pima County DOT	Road work	SWCA	Myers 1996
1996	3.45 acres	BLMSFO	Watershed rehab.	BLMSFO	Botsford 1996
1996	150 acres	BLMSFO	Watershed rehab.	BLMSFO	McRae 1997
1996	1100 acres	NBBJ	Development	SWCA	Lascaux and Antone 1996
1996	0.495 acres	TEP	Power line	P.A.S.T.	Stephen 1996a
1996	822 acres	ADOT	Road work	ARS	Wright 1996
1996	17.4 acres	ASLD	Pipeline	ACS	DeMaagd 1996b
1996	5.74 acres	EPNG	Cathodic station	ACS	Punzmann 1996a
1996	5.74 acres	EPNG	Cathodic station	ACS	Punzmann 1996c
1996	1.31 acres	U.S. West	Cable	ACS	DeMaagd 1996a
1996	54.5 acres	Old Vail Properties	Development	OPAC	Jones 1996b
1996-97	1755 acres	Olsen & Assoc.	Development	LMAS	Seymour et al. 1997
1997	11.7 miles	ADOT	Road work	ARS	Stone 1997
1997	63 miles	AEPCO	Power line	SWCA	Tucker 1998
1997	473.5 acres	AEPCO	Power line	SWCA	Tucker 1999a
1997	1.5 acres	City of Tucson	Development	DAI	Eppley 1997
1997	1090.5 acres	AEPCO	Power line	SWCA	Phillips 1997
1997	15 acres	Cella Barr Assoc,	Development	P.A.S.T.	Stephen 1997
1997	37 miles	SFPP	Pipeline	WSA	WSA 1997
1997	1.74 acres	ADOT	Road work	ARS	Palus 1997
1998	430 acres	ADOT	Road work	ARS	Wright and Palus 1998

Date	No. of Acres/Miles	Client/Sponsor	Undertaking	Performing Agency/ Consultant	Reference
1998	244.16 acres	Westland Resources	Development	OPAC	Jones 1998a
1998	19.7miles	ADOT	Road work	ARS	Woodall 1999
1998	29 acres	AMT	Mining permit	SWCA	Doak 1998
1998	80 miles	ADOT	Road work	Stantech	Larkin and Giacobbe 1998b
1998	0.72 miles	City of Tucson	Water main	DAI	Silvia 1998
1998	1.8 miles	City of Tucson	Well	DAI	Diehl 1998
1998	10.8 acres	ADOT	Road work	Stantech	Larkin and Giacobbe 1998a
1998	1.36 acres	Stonegate Ventures	Sewer	OPAC	Chavarria 1998
1998	1200'	ADOT	Road work	ARS	Shepard 1998
1998	625'	ADOT	Road work	DMI	Border and Garcia 1998
1998	640 acres	Alvin Ratiff	--	Tierra	Fratt and Powell 1998
1998-99	70 miles	EPNG	Pipeline	SWCA	Yoder and Chenault 2000
1999	1.41 acres	ADOT	Property disposal	ACS	DeMaagd 1999
1999	44 acres	SCS Engineers	Utility	SWCA	Desruisseaux 1999
1999	0.52 acres	City of Tucson	Well	DAI	Diehl 1999b
1999	42.1 acres	ADOT	Road work	LSD	Brown 1999b
1999	5 miles	EcoPlan	Road work	SRI	Deaver et al. 1999
1999	~60 acres	ADOT	Road work	LSD	LSD 2000
1999	1 acre	City of Tucson	Road work	DAI	Diehl 1999c
1999	5.94 acres	ADOT)	Road work	ARS	Hathaway 1999
1999	0.664 acre	Induvest	Development	SWCA	Tucker 1999b
1999	34.59 acres	ADOT	Road work	DMI	Hill and Garcia 1999a
1999	2006 acres	AECM	Development	OPAC	Jones 1999b
1999	1.25 miles	City of Tucson	Well	DAI	Diehl 1999a
1999	~641 acres	Parsons Brinkerhoff	Cable	SWCA	Doak 1999a, 1999b, 2001
1999	3.0 acres	Pima County	Development	OPAC	Kaldahl 1999b
1999	2.6 acres	R & S Holdings	Development	SRI	Gronhound 1999
1999	5.67 acres	Geronimo Partners	Development	OPAC	Jones 1999c
1999	4.3 acres	BCA	Development	OPAC	Jones 1999a
1999	88 acres	Western Partners	Development	SRI	Folb 1999
1999	17.2 acres	Pima Co. Parks	Development	OPAC	Kaldahl 1999a
1999	12 acres	ADOT	Road work	LSD	Brown 1999a
1999	20 acres	Sverdrup Civil	Road work	ARS	Stone 1999
1999	212 acres	AEPCO	Power line	SWCA	Kayser and Serrano 1999
2000	0.68 acres	Ashton	Borrow pit	Tierra	Hayes 2000

Date	No. of Acres/Miles	Client/Sponsor	Undertaking	Performing Agency/ Consultant	Reference
2000	55 acres	Vail School District	School	LMAS	Knoblock and Wordrasek 2000
2000	10 acres	Timothy Remick	Airstrip	Tierra	Sigler 2001
2000	2.24 acres	Giles Construction	Development	OPAC	Kaldahl 2000
2000	240 acres	ADOT	Road work	Entranco	Walsh and Montero 2000
2000	6000 acres	El Paso Energy Communications	Cable	SWCA	Tucker 2000
2000	4 acres	PF Net	Cable	WCRM	Walter and Kearns 2000
2000	0.91 acres	Kent Wonders	Development	P.A.S.T.	Stephen 2000e
2000	495.6 acres	AT&T/ NexGen	Cable	WCRM	Kearns et al. 2001
2000	1.7 acres	Agra Earth & Environmental	Cell towers	SWCA	Lindly 2000
2000	206.67 miles	--	Cable	TRC Mariah	Railey and Yost 2001
2000	10.9 acres	KMEP	Pipeline	URS	Hill et al. 2001
2000	35.25 acres	Diamond Ventures	Development	P.A.S.T.	Stephen 2000c
2000	29.4 miles	EcoPlan Associates	Road work	ARS	Barnes 2000
2000	--	RICK Engineering	Development	P.A.S.T.	Stephen 2000a
2000	6.43 acres	John Evans & Assoc.	Road work	P.A.S.T.	Stephen 2000d
2000	40 acres	Diamond Ventures	Development	P.A.S.T.	Stephen 2000b
2000	0.6 miles	City of Tucson	Water main	DAI	Cook 2000
2000	0.82 acres	EPNG	Cathodic station	SWCA	McDonald 2000
2000	1.5 miles	SSVEC	Utility	C&ES	Heuett 2000
2000-01	16.79 miles	Pima County	Trail	OPAC	Jones and Dart 2003
2001	1.12 miles	Westland Resources/ Vail Water	Development	OPAC	Kaldahl and Dart 2001
2001	5.2 miles	EcoPlan	Road work	ARS	Wright 2001
2001	0.96 acre	City of Benson	Landscaping	EEC	Fuller 2001
2001	1.5 acres	Stanley Engineering	Development	P.A.S.T.	Stephen 2001a
2001	1.25 acres	City of Tucson	Water main	DAI	Brack 2001
2001	1.01 acres	Stanley Engineering	Development	P.A.S.T.	Stephen 2001d
2001	1.195 acres	New World Development	Sewer	P.A.S.T.	Stephen 2001g
2001	3.86 acres	Stanley Engineering	Development	P.A.S.T.	Stephen 2001c
2001	4 acres	City of Tucson	Reservoir	DAI	Cook 2001
2001	16.6 acres	Architectural Design Group	Development	Tierra	Klune 2002b

Date	No. of Acres/Miles	Client/Sponsor	Undertaking	Performing Agency/ Consultant	Reference
2001	0.3 acre	David E. Shembeck Architects	Development	Aztlan	Slawson 2001a
2001	13 acres	Brown and Caldwell	Road work	SWCA	Doak and Hesse 2001
2001	25.3 acres	MJM Consulting	Development	P.A.S.T.	Stephen 2001h
2001	67 acres	KB Homes	Development	P.A.S.T.	Stephen 2001i
2001	0.13 acre	Titan Towers	Cell tower	SWCA	Plummer 2001b
2001	5.98 acres	Division II Construction	Development	Tierra	Hayes and Klune 2001
2001	87.22 acres	A. W. Mars	Development	Tierra	Hayes and Klune 2001b
2001	0.5 miles	--	Sewer	EEC	Fuller and Hoffman 2001
2001	38 acres	Central Arizona Investment Partners	Development	P.A.S.T.	Stephen 2001j
2001	1.18 acres	Creative Endeavors	Warehouse	SWCA	Plummer 2001a
2001	35 acres	Pima County	Park	OPAC	Kaldahl 2001a
2001	2.07 miles	Pima County DOT	Road construction	OPAC	Wyman 2001
2001	0.79 acre	Stanley Engineering	Development	P.A.S.T.	Stephen 2001b
2001	0.5 acre	BLMSFO	Watershed rehab.	BLMSFO	Rago 2001
2001	1.08 miles	John and June Wood	Access road	Tierra	Hayes and Zaglauer 2001
2001	605 acres	ADOT	Road work	Entranco	Davis 2001
2001	12 acres	RAS Builders	Development	OPAC	Kaldahl 2001b
2001	143.5 acres	ADOT	Road work	EcoPlan	Gentilli and Folb 2001
2001	18.15 acres	NEXTEL	Cell towers	URS	White and Rogge 2001
2001	0.01 acres	Starbridge Communications	Cell towers	Aztlan	Slawson 2001b
2001	752 acres	El Paso Global Networks	Cable	SWCA	Hesse 2001
2001	0.21 miles	TEP	Utility	OPAC	Jones and Dart 2001a
2001	80.95 acres	Miller Assoc.	Development	Tierra	Huntington 2001
2001	15 acres	Diamond Ventures	Development	P.A.S.T.	Stephen 2001f
2001	0.71 miles	TEP	Utility	P.A.S.T.	Stephen 2001e
2001	2.59 acres	CD Partners	Development	Aztlan	Slawson 2001c
2001	1.0 mile	PF Net/ AT&T	Utility	WCRM	Boden et al. 2003
2001	1 acre	TowerCom	Cell tower	PARDners	Musser-Lopes 2001
2002	5.3 acres	Miller Associates	Development	Tierra	Doak 2002a

Date	No. of Acres/Miles	Client/Sponsor	Undertaking	Performing Agency/ Consultant	Reference
2002	0.84 miles	SGC	Gas line	Tierra	Klune 2002a
2002	1 mile	TEP	Utility	SRI	Natoli and Sterner 2002
2002	0.01 acre	M3 Engineering	Monopole	EEC	Fuller 2002
2002	0.01 mile	QWEST	Cable	Tierra	Hayes 2001
2002	0.5 acres	City of Tucson	Well	DAI	Dutt 2000
2002	80 acres	City of Tucson	Recycling center	DAI	Swartz 2002
2002	0.25 miles	Westland Resources	Utility	OPAC	Jones and Dart 2002
2002	120 acres	KB Homes	Development	P.A.S.T.	Stephen 2002
2002	270 acres	Miller Assoc.	Development	Tierra	Doak 2002b
2002	10 acres	BLMSFO	Watershed rehab.	BLMSFO	Kinkade 2002
2002	2.25 acres	G&E Consultants	Development	SWCA	Lundin 2002
2002	0.5 mile	SGC	Gas line	Tierra	Olsson 2002b
2002	0.2 mile	SGC	Gas line	Tierra	Olsson 2002a
2002	~50 acres	Pima County	Hospital	SWCA	Plummer 2002
2003	3.00 acres	R. J. McMillan	Warehouse	P.A.S.T.	Stephen 2003
2003	0.25 acre	BLMSFO	Grazing permit	BLMSFO	McGrew 2003
2003	3 acres	Watson Architects	Development	Harris	Twilling 2003a
2003	0.64 acres	D. R. Horton Homes	Sewer	Tierra	Doak 2003
2003	31 acres	D. R. Horton Homes	Development	SWCA	Hesse 2003
2003	11.36 acres	Sayler-Brown Boldue	Development	Harris	Twilling 2003b
2003	11.43 miles	ADOT	Road work	EcoPlan	Baker 2003b, 2003c
2003	--	ADOT	Road work	ASM	Perrine 1983b
2004	18.80 acres	ADOT	Water line	Aztec	Macnider 2004
2004	39.5 acres	AT&T	Cable	WCRM	Baker 2004

A total of 186 sites have been recorded within 1 mile of the project area (Table 3.11-8). Properties within 1 mile of the project area that are listed in the National Register of Historic Places and the Arizona Register of Historic Places are Fort Bowie in Apache Pass, the former J. H. Smith store in Dragoon, and the Benson Multiple Property Submission (MPS). Fort Bowie National Historic Site (NHS) consists of the remains of the post occupied by the U.S. Army from 1862 to 1894. The property possesses significance at the national level within the context of warfare between the U.S. Army and the Chiricahua Apache from the 1860s until 1886 (Greene 1980). The site also contains the stage stop used by the Butterfield Overland mail and other companies (Conkling and Conkling 1947). Segment C runs through the northwest corner of the easternmost portion of the NHS.

Table 3.11-8. Previously Recorded Sites Within 1 Mile of Project Area.			
Site No.	**Site Type/Constituents**	**Cultural/ Temporal Affiliation(s)**	**Reference**
San Simon Pump Station 69 kV Power Line			
AZ CC:12:4 (ASM)	Flaked stone, ground stone	Archaic	Haury and Wendorf 1948
AZ CC:12:2 (ASM)	Mammoth Tusk with associated scraper	Paleo-Indian	Haury 1939
AZ CC:12:3 (ASM)	Artifact Scatter: sherds, flaked stone, ground stone, with associated charcoal stain	Mogollon/ca. 1000-1450	Haury, Wheat, Wendorf 1948
AZ CC:12:44 (ASM)	Masonry Structure (1), and Shed (1) with associated historic refuse	Euro-American/Late Historic	Howell and Natoli 1999
AZ CC:16:1 (ASM)	Ground stone, charcoal	Archaic	Farmer 1939
Segment C			
FOBO 02B-42	Artifact Scatter: historic refuse	Euro-American/Indeterminate	Moore et al. 2002a
FOBO 02B-29	Miner's Cabin with associated historic refuse	Euro-American/Indeterminate	Moore and Gardner 2002a
FOBO 02B-70	Artifact Scatter: flaked stone, ground stone, glass, metal	Prehistoric-Historic Transition	Burton and Gardner 2003a
FOBO 02B-28	Possible Historic Cache: two metal pins over a stone alcove	Euro-American/Indeterminate	Gordon 2002
FOBO 02B-72	Telephone Line Rock Piles (6) with associated historic refuse	Euro-American/Late Historic	Burton and Gardner 2003b
FOBO 02B-30	Mining Pits and Trenches with associated historic refuse	Euro-American/Indeterminate	Beckwith et al. 2002
FOBO 02B-32	Mining Pits, Trenches, Structures with associated historic refuse; Artifact Scatter: sherds, flaked stone, ground stone	Euro-American/Indeterminate; Prehistoric/Ceramic	Moore et al. 2002b
FOBO 02B-66	Artifact Scatter: sherds, flaked stone, ground stone	Prehistoric/Ceramic	Moore and Bonstead 2002
FOBO 02B-31	Rock Piles (2) with associated flaked stone, ground stone	Prehistoric/Indeterminate	Moore et al. 2002c
FOBO 02B-69	Artifact Scatter: flaked stone, metal, glass	Prehistoric-Historic Transition	Burton and Gardner 2003c

Table 3.11-8. Previously Recorded Sites Within 1 Mile of Project Area.

Site No.	Site Type/Constituents	Cultural/ Temporal Affiliation(s)	Reference
FOBO 02B-33	Rock Pile (1), Depressions (2), Bedrock Mortar (1) with associated sherds, flaked stone, ground stone, faunal remains	Prehistoric/Ceramic	Burton 2002a
FOBO 02B-68	Mining Rock Piles and Alignments (6) without associated historic artifacts; Artifact Scatter: sherds, flaked stone	Euro-American/Indeterminate; Prehistoric/Ceramic	Gardner and Burton 2003
FOBO 02B-67	Undefined Rock Feature (1) with associated sherds, flaked stone, ground stone	Prehistoric/Ceramic	Burton and Moore 2003
FOBO 02B-35	Rock Piles (4) with associated sherds, flaked stone	Prehistoric/Ceramic	Burton 2002b
FOBO 02B-52	Undefined Rock Features (3)	Euro-American/Indeterminate	Moore and Gardner 2002b
FOBO 02B-34	Rock Rings (7) with associated historic refuse	Euro-American/Indeterminate	Burton 2002c
FOBO 02B-61	Mining Tunnels without associated artifacts	Euro-American/Indeterminate	Young and Bucher 2003
AZ CC:15:75 (ASM)	Linear: County Road	Euro-American/Late Historic	Tucker and Hesse 2000
AZ CC:15:64 (ASM)	Linear: Abandoned Road	Euro-American/Middle Historic	Jensen and Gage 1994a
AZ CC:15:49 (ASM)	Linear: Abandoned Road	Euro-American/Middle Historic	Jensen and Gage 1994b
AZ CC:15:65 (ASM)	Linear: Abandoned Road	Euro-American/Late Historic	Jensen and Gage 1994c
AZ CC:15:62 (ASM)	Masonry Structure (1), Mine Pits (5), Rock Cairns (3), Ore Loading Ramp (1), Mine Tailings with associated historic refuse	Euro-American/Indeterminate	Botsford 1994c
AZ CC:15:55 (ASM)	Masonry Structures (2), Outbuilding (1), Reservoir (1), Mine (1), Tailings Pile (1), Well (1), etc., with associated historic refuse	Euro-American/Indeterminate	Botsford 1994d
AZ CC:15:54 (ASM)	Masonry Structures (2), Mine (1) with associated historic refuse	Euro-American/Indeterminate	Botsford 1994e

Table 3.11-8. Previously Recorded Sites Within 1 Mile of Project Area.

Site No.	Site Type/Constituents	Cultural/ Temporal Affiliation(s)	Reference
AZ CC:15:61 (ASM)	Tent Base (1), Mine (1), Corral (1), Trail (1) with associated historic refuse	Euro-American/Indeterminate	Botsford 1994f
AZ CC:15:52 (ASM)	House Foundation (1), Tent Base (1) with associated historic refuse	Euro-American/Indeterminate	Botsford 1994g
AZ CC:15:51 (ASM)	Rock Alignment (1), Well (1) with associated historic refuse	Euro-American/Indeterminate	Botsford 1994h
AZ CC:15:85 (ASM)	Possible Portable Forge: Rock Ring (1) with associated metal artifacts	Euro-American/Indeterminate	Botsford 1994i
AZ CC:15:53 (ASM)	Tent Base (1), Mine (1) with associated historic refuse	Euro-American/Indeterminate	Botsford 1994j
AZ CC:15:58 (ASM)	"Quillian Claims Mining Camp" Mine Shafts, Prospects, and Tunnel (5), Trail (1), Mine Tailings (1) with associated historic refuse	Euro-American./Indeterminate	Botsford 1994k
AZ CC:15:56 (ASM)	Probable Tent Base (1) with associated historic refuse	Euro-American/Indeterminate	Botsford 1994l
AZ CC:15:59 (ASM)	Tent Base (1), Check Dam (1) with associated historic refuse	Euro-American/Indeterminate	Botsford 1994m
AZ CC:15:57 (ASM)	Mine and Tunnel (1) without associated artifacts	Euro-American/Indeterminate	Botsford 1994n
AZ CC:15:60 (ASM)	Rock Piles (2), Mine (2), Assay Area (1), Work Area (1), Trail (1) with associated historic refuse	Euro-American/Indeterminate	Botsford 1994o
AZ CC:13:15 (ASM)	Artifact Scatter: sherds	Mogollon	Coe and Rieger 1977a
AZ CC:13:16 (ASM)	Artifact Scatter: sherds, flaked stone, ground stone	Mogollon	Coe and Rieger 1977b
AZ CC:13:46 (ASM)	Depressions (2), Trash Dump (1), Undefined Rock Feature (1) with associated historic refuse	Euro-American/Indeterminate	Phillips and Powell 1995
AZ CC:13:51 (ASM)	CCC Spreaders (2) without associated artifacts	Euro-American/Late Historic	Kayser et al. 1999a
AZ BB:16:24 (ASM)	CCC Spreaders (3+) without associated artifacts	Euro-American/Late Historic	Kayser et al. 1999f

Table 3.11-8. Previously Recorded Sites Within 1 Mile of Project Area.

Site No.	Site Type/Constituents	Cultural/ Temporal Affiliation(s)	Reference
AZ BB:16:27 (ASM)	CCC Spreaders (≥5), Rubble Pile (1), Rock Alignments (2) without associated artifacts	Euro-American/Late Historic	Kayser et al. 1999b
AZ BB:16:26 (ASM)	CCC Spreaders (≥4), Rubble Pile (1) without associated artifacts	Euro-American/Late Historic	Kayser et al. 1999c
AZ BB:16:18 (ASM)	Artifact Scatter: sherds, flaked stone, ground stone	Prehistoric/Ceramic	ASM 2000
AZ BB:16:25 (ASM)	Hearths (2) with associated sherds, flaked stone	Prehistoric/Ceramic	Kayser et al. 1999d
AZ BB:16:7 (ASM)	Trash Mound (1), Rock Piles (?) with associated sherds, flaked stone	Prehistoric/Ceramic	Hammack 1982
AZ BB:16:28 (ASM)	Rock Pile (1) with associated ground stone	Prehistoric or Historic/ Indeterminate	Kayser et al. 1999e
AZ BB:16:5 (ASM)	Bedrock Mortars (?) with associated pestle	Prehistoric/Indeterminate	Polk 1973a
AZ EE:4:6 (ASM)	Field House (1), Rock Ring (1) with associated sherds	Prehistoric/Ceramic	Hammack 1969
AZ EE:3:20 (ASM)	Bridge Abutments	Euro-American/Late Historic	Harmon and Woodall 1995a
AZ EE:4:43 (ASM)	Linear: NM&A Railroad Grade and associated Features	Euro-American/Middle and Late Historic	Wright et al. 1997
AZ EE:3:64 (ASM)	Artifact Scatter: historic refuse, possible prehistoric sherds	Euro-American/Late Historic	Shepard and Woodall 1998
AZ EE:3:52 (ASM)	SP Underpass to BR 10	Euro-American/Late Historic	Harmon and Woodall 1995b
AZ EE:3:51 (ASM)	SR 80/BR 10 Bridge	Euro-American/Late Historic	Harmon and Woodall 1995c
AZ EE:3:6 (AMF)	Burial with associated artifacts	Paleoindian	Scott 1966
AZ EE:3:96 (ASM)	Artifact Scatter: historic refuse; Artifact Scatter: sherds	Euro-American/Indeterminate; Prehistoric/Ceramic	Hart 2001
AZ EE:3:50 (ASM)	Linear: Sidewalk	Euro-American/Late Historic	Harmon and Woodall 1995d
AZ EE:3:49 (ASM)	Artifact Scatter: flaked stone	Middle Archaic	Heuett and Johnson 1995
AZ EE:3:2 (ASM)	Artifact Scatter: flaked stone, ground stone, faunal remains	Middle Archaic	Grey and Conforti 1994

Table 3.11-8. Previously Recorded Sites Within 1 Mile of Project Area.

Site No.	Site Type/Constituents	Cultural/ Temporal Affiliation(s)	Reference
AZ EE:3:3 (ASM)	Mammoth and horse remains with associated flaked stone, ground stone	Paleoindian; Middle Archaic	Hemmings and Haynes 1967
AZ EE:7:176 (ASM)	Linear: SR 90	Euro-American/Late Historic	Wright 1992c
AZ EE:3:39 (ASM)	Artifact Scatter: historic refuse	Euro-American/Indeterminate	Stone and Wright 1992
AZ EE:3:15 (ASM)	Artifact Scatter: historic refuse	Euro-American/Indeterminate	Polk 1973b
AZ EE:3:60 (ASM)	Artifact Scatter: flaked stone	Prehistoric/Indeterminate	Kwiatkowski and Dreher 1997a
AZ EE:3:59 (ASM)	Undefined Rock Features (2), Rock Ring (1) with associated San Pedro projectile point, flaked stone	Possible Late Archaic	Kwiatkowski and Dreher 1996
AZ EE:2:163 (ASM)	Possible Bedrock Mortar (1) with associated flaked stone	Archaic	Curtis and Hathaway 1988
AZ EE:2:162 (ASM)	Artifact Scatter: flaked stone	Prehistoric/Indeterminate	Bassett 1989a
AZ EE:2:326 (ASM)	Artifact Scatter: flaked stone	Prehistoric/Indeterminate	Kwiatkowski 1996
AZ EE:2:325 (ASM)	Rock Ring (1) with associated flaked stone	Possibly Archaic	Kwiatkowski and Dreher 1997b
AZ EE:2:251 (ASM)	Pit house (1) with associated sherds, flaked stone, ground stone	Hohokam/Indeterminate	Thiel and Murray 1996a
AZ EE:2:409 (ASM)	Artifact Scatter: sherds, flaked stone, ground stone	Prehistoric/Ceramic	Stevens 1997
AZ EE:2:249 (ASM)	Structures (6), Well (1), Windmill (1) with associated historic refuse	Euro-American/Middle and Late Historic	Thiel and Murray 1996b
AZ EE:2:485 (ASM)	Undefined Rock Feature (1), Hearth (1) with associated historic refuse; Artifact Scatter: flaked stone	Euro-American/Indeterminate; Prehistoric/Indeterminate	Kearns et al. 2000a
AZ EE:2:408 (ASM)	Artifact Scatter: flaked stone	Prehistoric/Indeterminate	Walker 1973
AZ EE:2:250 (ASM)	Artifact Scatter: historic refuse	Euro-American/Middle and Late Historic	Thiel and Murray 1996c

Table 3.11-8. Previously Recorded Sites Within 1 Mile of Project Area.

Site No.	Site Type/Constituents	Cultural/ Temporal Affiliation(s)	Reference
AZ EE:2:489 (ASM)	Lithic Procurement Locale with discrete Flaking Stations: flaked stone	Prehistoric/Indeterminate	Kearns et al. 2000b
AZ EE:2:165 (ASM)	Artifact Scatter: historic refuse	Euro-American/Indeterminate	Seymour and Doak 1999
AZ EE:2:241 (ASM)	Artifact Scatter: historic refuse; Artifact Scatter: sherds, flaked stone	Euro-American/Late Historic; Hohokam/Pre-Classic, Classic	Stevens 1995a
AZ BB:14:25 (ASM)	"New Pantano": former SP station with associated historic refuse; Late Archaic projectile point; Rock Piles (4), Rock Rings (4), with associated sherds, flaked stone, shell, human remains, ground stone, FAR	Euro-American/Middle and Late Historic; Late Archaic; Hohokam/Pre-Classic, Classic	Ayres and Rieder 2006
AZ EE:2:242 (ASM)	Artifact Scatter: sherds, flaked stone	Hohokam/Pre-Classic	Stevens 1995b
AZ EE:2:244 (ASM)	Artifact Scatter: sherds, flaked stone	Hohokam/Pre-Classic, Classic	Stevens 1996
AZ EE:2:243 (ASM)	Rock rings (5+) with associated sherds, flaked stone, ground stone	Hohokam/Pre-Classic, Classic	Stevens 1995c
AZ EE:2:438 (ASM)	Artifact Scatter: sherds, flaked stone; Archaic projectile point	Hohokam/Classic; Possible Archaic/ Indeterminate	Wright et al. 1998a
AZ EE:2:439 (ASM)	Artifact Scatter: historic refuse; Artifact Scatter: sherds, flaked stone, ground stone	Euro-American/Indeterminate; Hohokam/Pre-Classic	Stevens, Fite, and Billings 1996
AZ EE:2:50 (ASM)	Burials, Hearths, Midden with associated artifacts	Late Archaic	Eddy and Cooley 1983
AZ EE:2:492 (ASM)	"Old Pantano," former SP station with associated historic refuse	Euro-American/Middle Historic	Rieder et al. 1996
AZ BB:14:701 (ASM)	Two-Track Road	Euro-American/Indeterminate	Schmidt 2001
AZ BB:14:558 (ASM)	Artifact Scatter: sherds, flaked stone, shell pendant	Hohokam/Pre-Classic, Classic	Conforti 1995a
AZ BB:14:560 (ASM)	Artifact Scatter: sherds, flaked stone	Hohokam/Pre-Classic	Conforti 1995b
AZ EE:2:240 (ASM)	Artifact Scatter: sherds, flaked stone	Hohokam/Indeterminate	Conforti 1995c

Table 3.11-8. Previously Recorded Sites Within 1 Mile of Project Area.

Site No.	Site Type/Constituents	Cultural/ Temporal Affiliation(s)	Reference
AZ EE:2:247 (ASM)	Bedrock Mortars (17) without associated artifacts	Prehistoric/Indeterminate	Fite 1996a
AZ EE:2:245 (ASM)	Linear: Railroad Grade (1), Wooden Shack (1) with associated historic refuse; Artifact Scatter: sherds, flaked stone, ground stone; Late Archaic projectile point	Euro-American/Late Historic; Hohokam/Indeterminate; Archaic/Late Archaic	Fite 1996b
AZ EE:2:246 (ASM)	Linear: Railroad Grade (1) with associated historic refuse; Artifact Scatter: sherds, flaked stone, ground stone	Euro-American/Late Historic; Hohokam/Pre-Classic, Classic	Fite 1996c
AZ EE:2:248 (ASM)	Rock Pile (1); Artifact Scatter: sherds, flaked stone	Euro-American/Indeterminate; Hohokam/Indeterminate	Fite 1996d
AZ EE:2:239 (ASM)	Artifact Scatter: historic refuse; Artifact Scatter: sherds, flaked stone, ground stone	Euro-American/Indeterminate; Hohokam/Pre-Classic, Classic	Fite 1995a
AZ EE:2:160 (ASM)	Artifact Scatter: flaked stone	Prehistoric/Indeterminate	Champagne 1986
AZ EE:2:238 (ASM)	Artifact Scatter: historic refuse; Artifact Scatter: sherds, flaked stone	Euro-American/Indeterminate; Hohokam/Pre-Classic	Fite 1995b
AZ EE:2:236 (ASM)	Artifact Scatter: sherds, flaked stone	Hohokam/Indeterminate	Conforti 1995d
AZ EE:2:166 (ASM)	Mescal Station: Structures (3) with associated historic refuse; Artifact Scatter: sherds	Euro-American/Middle Historic; Prehistoric/Indeterminate	Ayres and Rieder 2006
AZ BB:14:559 (ASM)	Undefined Rock Alignment (1), Stone Wall Foundation (1) with historic refuse; Bedrock Mortars (2), Structure Foundation (1) with associated sherds, flaked stone, ground stone	Euro-American/Late Historic; Hohokam/Pre-Classic, Classic	Conforti 1995e
AZ BB:14:551 (ASM)	Artifact Scatter: sherds, flaked stone, ground stone	Hohokam/Pre-Classic, Classic	Murray et al. 1995a
AZ EE:2:237 (ASM)	Artifact Scatter: historic refuse; Artifact Scatter: sherds, flaked stone	Euro-American/Indeterminate; Hohokam/Pre-Classic, Classic	Fite 1995c

Table 3.11-8. Previously Recorded Sites Within 1 Mile of Project Area.

Site No.	Site Type/Constituents	Cultural/ Temporal Affiliation(s)	Reference
AZ BB:14:555 (ASM)	Bedrock Mortars (2) without associated artifacts	Prehistoric/Indeterminate	Murray 1995
AZ BB:14:557 (ASM)	Bedrock Mortars (8)	Prehistoric/Indeterminate	Fite 1995d
AZ BB:14:550 (ASM)	Rock Piles (≥8) with associated sherds, flaked stone, ground stone	Hohokam/Pre-Classic, Classic	Murray et al. 1995b
AZ BB:14:554 (ASM)	Undefined Rock Features (≥6) with associated sherds, flaked stone, ground stone, FAR	Hohokam/Indeterminate	Fite 1995e
AZ BB:14:552 (ASM)	Animal Corral with associated historic refuse; Artifact Scatter: sherds, flaked stone, ground stone, FAR	Euro-American/Indeterminate; Hohokam/Pre-Classic, Classic	Fite 1995f
AZ BB:14:549 (ASM)	Bedrock Mortar (1) with associated sherds, flaked stone	Prehistoric/Indeterminate	Murray et al. 1995c
AZ BB:14:548 (ASM)	Bedrock Mortars (4), Undefined Depression (4), Undefined Rock Alignment (1) with associated sherds, flaked stone	Prehistoric/Ceramic	Murray et al. 1995d
AZ BB:14:553 (ASM)	Artifact Scatter: sherds, flaked stone, ground stone	Hohokam/Classic	Fite 1995g
AZ BB:14:539 (ASM)	Artifact Scatter: sherds, flaked stone	Hohokam/Pre-Classic, Classic	Conforti 1995f
AZ BB:14:537 (ASM)	Artifact Scatter: sherds, flaked stone	Hohokam/Pre-Ceramic	Conforti 1995g
AZ BB:14:538 (ASM)	Artifact Scatter: sherds, flaked stone, ground stone; Undefined Rock Features (2+)	Hohokam/Middle Ceramic	Conforti 1995h
AZ BB:14:542 (ASM)	Rock Pile (1) with associated sherds, flaked stone	Hohokam/Pre-Classic, Classic	Stevens 1995d
AZ BB:14:541 (ASM)	Undefined Rock Features (2) with associated sherds, flaked stone	Hohokam/Indeterminate	Stevens 1995e
AZ BB:14:540 (ASM)	Rock Pile (1) with sherds, flaked stone, ground stone	Hohokam/Pre-Classic, Classic	Stevens 1995f
AZ BB:14:546 (ASM)	Artifact Scatter: sherds, flaked stone, ground stone, faunal remains	Hohokam/Pre-Classic, Classic	Stevens 1995g

Table 3.11-8. Previously Recorded Sites Within 1 Mile of Project Area.

Site No.	Site Type/Constituents	Cultural/ Temporal Affiliation(s)	Reference
AZ BB:14:533 (ASM)	Stone Enclosure (1) with associated historic refuse	Euro-American/Late Historic	Doelle 1995a
AZ BB:14:71 (ASM)	Undefined Rock Feature (1), Possible Water Control Structure (1) with associated sherds, flaked stone, ground stone	Hohokam/Indeterminate	Mead and Masse 1973
AZ BB:14:532 (ASM)	Clearing in desert pavement (1) with associated flaked stone	Archaic/Late	Doelle 1995b
AZ BB:14:531 (ASM)	Artifact Scatter: sherds, flaked stone, ground stone	Hohokam/Pre-Classic, Classic	Doelle 1995c
AZ BB:14:530 (ASM)	Possible Pit House depressions (5+) with associated sherds, flaked stone, and ground stone	Prehistoric/Late Ceramic	Doelle 1995d
AZ BB:14:161 (ASM)	Structural Mound (1), Structure (1) with associated sherds, flaked stone, ground stone	Hohokam/Pre-Classic, Classic	Wallace 1982a
AZ BB:14:160 (ASM)	Bedrock Mortars (5) with associated pestle (1)	Hohokam/Indeterminate	Wallace 1982b
AZ BB:14:535 (ASM)	Undefined Rock Alignments (2), Rock Pile (1) with associated historic refuse	Euro-American/Late Historic	Stevens 1995h
AZ BB:14:601 (ASM)	Railroad Grade (1), Roadbeds (2), Undefined Rock Alignments (3) with associated historic refuse; Undefined Rock Features (5) with associated sherds, flaked stone, ground stone, faunal remains, FAR	Euro-American/Indeterminate; Hohokam/Indeterminate; Archaic/Indeterminate	Tucker 1996
AZ BB:14:638 (ASM)	Possible Structure Foundation ($\geq$1) with associated historic refuse; Rock Piles ($\geq$4) with associated sherds, flaked stone, ground stone	Euro-American/Indeterminate; Hohokam/Pre-Classic	Stevens and Conforti 1996
AZ BB:14:23 (ASM)	Rock Shelter with associated sherds, digging stick, matting, corn cobs	Hohokam/Indeterminate	Johnson 1963
AZ BB:14:497 (ASM)	Artifact Scatter: historic refuse	Euro-American/Indeterminate	Jones 1990

Table 3.11-8. Previously Recorded Sites Within 1 Mile of Project Area.

Site No.	Site Type/Constituents	Cultural/ Temporal Affiliation(s)	Reference
AZ BB:14:534 (ASM)	Artifact Scatter: historic refuse	Euro-American/Late Historic	Stevens 1995i
AZ BB:14:651 (ASM)	Trash Dump: historic refuse	Euro-American/Late Historic	Wright et al. 1998b
AZ BB:14:692 (ASM)	Homestead: Stone House Foundation (1) , Rock Alignments (2), Outbuildings (3) with associated historic refuse	Euro-American/Late Historic	Hayes and Zaglauer 2001b
AZ BB:14:665 (ASM)	Concrete Pads (3), Historic Structure (1), Concrete House Foundation (1), Rock Rings (2) with associated historic refuse	Euro-American/Late Historic	Doak 1999c
AZ BB:14:63 (ASM)	Artifact Scatter: sherds, flaked stone, ground stone	Hohokam/Pre-Classic	Kayser and Fiero 1969a
AZ BB:14:664 (ASM)	Artifact Scatter: historic refuse	Euro-American/Late Historic	Hill and Garcia 1999b
AZ BB:14:61 (ASM)	Artifact Scatter: sherds, flaked stone, ground stone; Possible Pit Houses	Archaic/Cochise(?); Prehistoric/Indeterminate	Kayser and Fiero 1969b
AZ BB:14:521 (ASM)	Bedrock Mortar (1) with associated sherds, flaked stone, ground stone	Hohokam/Indeterminate	Stevens 1995j
AZ BB:14:513 (ASM)	Artifact Scatter: sherds, flaked stone, ground stone	Hohokam/Pre-Classic	Stevens and Freeman 1995a
AZ BB:14:512 (ASM)	Undefined Rock Alignment (1) with associated sherds, flaked stone, ground stone	Archaic/Late	Stevens and Freeman 1995b
AZ BB:14:515 (ASM)	Rock Piles (≥2) with historic refuse	Euro-American/Late Historic	Doelle 1995e
AZ BB:14:514 (ASM)	Artifact Scatter: sherds, flaked stone, ground stone	Archaic/Indeterminate; Hohokam/Indeterminate	Doelle 1995f
AZ BB:14:16 (ASM)	Roasting Pits (2), Rock Alignment (1), and Check Dam (1) with associated sherds, flaked stone, shell, ground stone, FAR	Hohokam/Late Pre-Classic, Classic	Cassidy 1959
AZ BB:14:510 (ASM)	Undefined Rock Feature (1) with associated flaked stone, ground stone	Prehistoric/Indeterminate	Doelle 1995g
AZ BB:14:650 (ASM)	Artifact Scatter: flaked stone	Possible Archaic/ Indeterminate	Jones 1997

Table 3.11-8. Previously Recorded Sites Within 1 Mile of Project Area.

Site No.	Site Type/Constituents	Cultural/ Temporal Affiliation(s)	Reference
AZ BB:14:511 (ASM)	Undefined Rock Feature (1) with associated sherds, flaked stone, shell, ground stone	Hohokam/Pre-Classic	Doelle 1995h
AZ BB:14:628 (ASM)	Structure Foundations (2) with associated historic refuse; Artifact Scatter: sherds, flaked stone, ground stone	African-American/Late Historic; Hohokam/Pre-Classic, Classic	Richardson et al. 1996a
AZ BB:14:662 (ASM)	Rancho del Lago: Partially demolished Working/Guest Ranch	Euro-American/Late Historic	O'Mack 1998
AZ BB:14:604 (ASM)	Artifact Scatter: historic refuse	Euro-American/Middle Historic	Jones 1996a
AZ BB:14:622 (ASM)	Artifact Scatter: sherds, flaked stone, ground stone	Hohokam/Pre-Classic	Richardson et al. 1996b
AZ BB:14:18 (ASM)	Vail, former SP station with associated historic refuse	Euro-American/Middle and Late Historic	Bassett 1989b
AZ BB:14:629	Concrete Grave Markers (3) without associated historic artifacts	Euro-American/Middle and Late Historic	Stipe-Davis 1996
AZ BB:14:614 (ASM)	Artifact Scatter: flaked stone	Prehistoric/Indeterminate	Seymour et al. 1996a
AZ BB:14:613 (ASM)	Artifact Scatter: sherds, flaked stone	Hohokam/Pre-Classic	Seymour et al. 1996b
AZ BB:14:612 (ASM)	Artifact Scatter: sherds, flaked stone, ground stone	Hohokam/Pre-Classic	Hungerford et al. 1996
AZ BB:14:616 (ASM)	Rock Alignments ($\geq$2), Wood Alignment (1) with associated historic refuse	Mexican-American/ Post AD 1700	Nichols 1996
AZ BB:14:615 (ASM)	Artifact Scatter: sherds, flaked stone, ground stone	Hohokam/Pre-Classic, Classic	Nichols et al. 1996
AZ BB:14:634 (ASM)	Linear: Canal	Historic or Prehistoric/ Indeterminate	Seymour and Stipe-Davis 1996
AZ BB:13:329 (ASM)	Roasting Pit (1) without associated artifacts	Hohokam/Indeterminate	Douglas 1987c
AZ BB:13:327 (ASM)	Roasting Pits (3) with associated sherds	Hohokam/Indeterminate	Douglas 1987d
AZ BB:13:328 (ASM)	Roasting Pit (1) without associated artifacts	Hohokam/Indeterminate	Douglas 1987e
AZ BB:13:382 (ASM)	Esmond Station: Structures with associated refuse	Euro-American/Middle Historic and Late Historic	Rieder and Ayres 1999
AZ BB:13:655 (ASM)	Hearths (3) and Midden (1) with associated sherds, flaked stone, ground stone, FAR	Hohokam/Indeterminate	Webb et al. 2000

Table 3.11-8. Previously Recorded Sites Within 1 Mile of Project Area.

Site No.	Site Type/Constituents	Cultural/ Temporal Affiliation(s)	Reference
AZ BB:13:698 (ASM)	Linear: Rita Road, with two associated historic refuse scatters	Euro-American/Late Historic	Smith 2002
AZ BB:13:555 (ASM)	"Rita Encampment Site" Possible Encampment/Trash Dumps (2): historic refuse	Euro-American/Late Historic	Jones 1998c
AZ BB:13:530 (ASM)	Rock Pile with historic refuse; Roasting Pits (2) with associated sherds, flaked stone, FAR	Euro-American/Late Historic; Hohokam/Pre-Classic, Classic	Lascaux and Antone 1996
AZ BB:13:666 (ASM)	Rock Piles (92) with associated sherds, flaked stone, ground stone	Hohokam/Classic	Barnes 2001
AZ BB:13:478 (ASM)	Roasting Pit (1) with associated flaked stone	Prehistoric/Indeterminate	Carpenter and Sanhez 1995
AZ BB:13:529 (ASM)	Late Archaic projectile point; Roasting Pits (2) with associated sherds, flaked stone, ground stone, FAR	Archaic/Late; Hohokam/Pre-Classic	Lascaux and Antone 1996
AZ BB:13:527 (ASM)	Artifact Scatter: historic refuse; Roasting Pits (9) with associated sherds, flaked stone, ground stone, faunal remains, FAR	Euro-American/Middle Historic; Hohokam/Pre-Classic, Classic	Lascaux and Antone 1996
AZ BB:13:528 (ASM)	Artifact Scatter: historic refuse; Rock Pile (1) with associated flaked stone, ground stone	Euro-American/Late Historic; Prehistoric/Indeterminate	Antone, Sayre, and Johnston 1996
AZ BB:13:526 (ASM)	Roasting Pits (2) and Rock Piles (2) with associated sherds, flaked stone, FAR	Hohokam/Pre-Classic, Classic	Lascaux and Antone 1996
AZ BB:13:525 (ASM)	Late Archaic projectile point; Artifact Scatter: sherds, flaked stone, ground stone, FAR	Archaic/Late; Hohokam/Pre-Classic	Lascaux and Antone 1996
AZ BB:13:524 (ASM)	Late Archaic projectile point; Roasting Pits (2) with associated sherds, flaked stone, ground stone	Archaic/Late; Hohokam/Pre-Classic	Lascaux and Antone 1996

Table 3.11-8. Previously Recorded Sites Within 1 Mile of Project Area.			
Site No.	**Site Type/Constituents**	**Cultural/ Temporal Affiliation(s)**	**Reference**
AZ BB:13:523 (ASM)	Roasting Pits (14) with associated sherds, flaked stone, ground stone	Hohokam/Pre-Classic	Lascaux and Antone 1996
AZ BB:13:531 (ASM)	Roasting Pits (17) with associated sherds, flaked stone, ground stone, faunal remains, FAR	Hohokam/Late Pre-Classic, Classic	Lascaux and Antone 1996
AZ BB:13:532 (ASM)	Roasting Pits (3) with associated sherds, flaked stone, ground stone, faunal remains, FAR	Hohokam/Late Pre-Classic, Classic	Lascaux and Antone 1996
AZ BB:13:124 (ASM)	Hand Dug Well and Ramada Shelter with associated historic refuse; Roasting Pits (2)with associated flaked stone, FAR, and ground stone	Euro-American/Middle and Late Historic; Hohokam/Indeterminate	Cummings and Fink 1979
AZ BB:13:577 (ASM)	Linear: EP&SW Railroad Grade, Ditch, and parallel Access Roads	Euro-American/Post AD 1700	Deaver and Ratliff 1999
AZ BB:13:46 (ASM) (Destroyed)	Possible Trash Mounds with associated sherds	Hohokam/Classic	Vivian and Ayres 1964
AZ BB:13:40 (ASM) (Destroyed)	Roasting Pits (2) with associated sherds and charcoal	Hohokam/Ceramic	Wasley 1963
AZ BB:13:540 (ASM)	Roasting Pits (3) without associated artifacts	Hohokam/Indeterminate	Jones and Stephen 1997
AZ BB:13:39 (ASM) (Destroyed)	Artifact Scatter: sherds	Hohokam/Ceramic	Leavitt and Johnson 1961

Table 3.11-9 presents NRHP eligibility and treatment recommendation for both previously recorded and currently recorded sites in Segment C that may be impacted by the proposed action. Thirteen of these sites were recommended as NRHP eligible. A monitor will be provided for all ground disturbing activities near and within the boundaries of sites determined eligible for the NRHP and for other areas determined to have a high potential for buried cultural deposits.

Table 3.11-9. Archaeological Sites in Segment C: NRHP Eligibility and Treatment Recommendations					
Site No.	**Location**	**Land Status**	**Cultural/ Temporal Affiliation**	**Eligibility**	**Recommended Treatment**
San Simon Pump Station 69 kV Power Line					

Table 3.11-9. Archaeological Sites in Segment C: NRHP Eligibility and Treatment Recommendations

Site No.	Location	Land Status	Cultural/ Temporal Affiliation	Eligibility	Recommended Treatment
AZ Z:2:40 (ASM)	T13S, R31E, S33	Private	Euro-American/ middle to late historic	Non-contributing	None
AZ AA:16:377 (ASM)	T13S, R31E, S33	ADOT	Euro-American/ late historic	Non-contributing	None
AZ CC:16:22 (ASM)	T13S, R31E, S33	County	Euro-American/ late historic	Not eligible	None
AZ CC:16:39 (ASM)*	T14S, R31E, S4	Private	Euro-American/ late historic	Not eligible	None
AZ CC:16:38 (ASM)*	T14S, R31E, S10	Private	Archaic	Eligible under D	None
AZ CC:16:21 (ASM)	T14S, R31E S21	County	Euro-American/ late historic	Not eligible	None
Segment C					
AZ CC:15:76 (ASM)	T14S, R28E, S36	County	Euro-American/ middle historic	Not eligible	None
AZ CC:15:80 (ASM)	T14S, R28E, S36	Private	Euro-American/ late historic	Eligible under A	Conduct mitigative documentation within APE; fence remainder
AZ T:14:61 (ASM)	T15S, R28E, S3	NPS	Euro-American/ middle historic	Non-contributing	None
AZ CC:15:77 (ASM)	T15S, R28E, S9	Private	Euro-American/ late historic	Not eligible	None
AZ CC:14:58 (ASM)*	T15S, R27E, S14	Private	Euro-American/ late historic	Eligible under A, C	Conduct mitigative documentation
AZ CC:14:20 (ASM)	T15S, R27E, S14	ADOT	Euro-American/ late historic	contributing under D	None
AZ CC:14:26 (ASM)	T15S, R27E, S20	Private	Euro-American/ late historic	Not eligible	None

Table 3.11-9. Archaeological Sites in Segment C: NRHP Eligibility and Treatment Recommendations

Site No.	Location	Land Status	Cultural/ Temporal Affiliation	Eligibility	Recommended Treatment
AZ CC:13:56 (ASM)	T15S, R25E, S36	County	Euro-American/ late historic	Not eligible	None
AZ FF:1:34 (ASM)	T16S, R24E, S10	Private	Euro-American/ late historic	Non-contributing	None
AZ CC:3:91 (ASM)	T16S, R24E, S10	ADOT	Euro-American/ late historic	Non-contributing	None
AZ CC:13:54 (ASM)	T16S, R24E, S8	County	Euro-American/ late historic	Not eligible	None
AZ CC:13:47 (ASM)	T16S, R24E, S18	Private	Euro-American/ late historic	Not eligible	None
AZ BB:16:48 (ASM) Crossing 1	T16S, R23E, S22	ASLD	Euro-American/ late historic	contributing under A	None
AZ CC:13:55 (ASM)	T16S, R23E, S22	County	Euro-American/ late historic	Not eligible	None
AZ BB:16:48 (ASM) Crossing 2	T16S, R23E, S21	Private	Euro-American/ late historic	contributing under A	None
AZ BB:16:37 (ASM)	T16S, R23E, S21	County	Euro-American/ late historic	Not eligible	None
AZ BB:16:38 (ASM)	T16S, R23E, S20	County	Euro-American/ late historic	Not eligible	None
AZ BB:16:39 (ASM)	T16S, R23E, S30	County	Euro-American/ late historic	Not eligible	None
AZ BB:16:40 (ASM)	T16S, R22E, S25	Private	Archaic, Mogollon	Eligible under D	Avoid using access route, or conduct phased data recovery and monitor
AZ BB:16:48 (ASM) Crossing 3	T16S, R22E, S25	Private	Euro-American/ late historic	contributing under A	None
AZ BB:16:48 (ASM) Crossing 4	T16S, R22E, S25	Private	Euro-American/ late historic	contributing under A	None

Table 3.11-9. Archaeological Sites in Segment C: NRHP Eligibility and Treatment Recommendations

Site No.	Location	Land Status	Cultural/ Temporal Affiliation	Eligibility	Recommended Treatment
AZ Z:2:40 (ASM) Crossing 1	T16S, R22E, S25	Private	Euro-American/ middle historic	contributing under A	None
AZ BB:16:48 (ASM) Crossing 5	T16S, R22E, S34	ASLD	Euro-American/ late historic	contributing under A	None
AZ Z:2:40 (ASM) Crossing 2	T17S, R21E, S2	ASLD	Euro-American/ late historic	contributing under A	Conduct mitigative documentation
AZ EE:4:161 (ASM)	T17S, R21E, S2	ASLD	Euro-American/ middle to late historic	Not eligible	None
AZ Z:2:40 (ASM) Crossing 3	T17S, R21E, S2	ASLD	Euro-American/ late historic	contributing under A	Conduct mitigative documentation
AZ Z:2:40 (ASM) Crossing 4	T17S, R21E, S2	Private	Euro-American/ late historic	Non-contributing	None
AZ Z:2:40 (ASM) Crossing 5	T17S, R21E, S8	ASLD	Euro-American/ late historic	Non-contributing	None
AZ Z:2:40 (ASM) Crossing 6	T17S, R21E, S7	Private	Euro-American/ late historic	contributing under A	None
AZ EE:3:85 (ASM)	T17S, R20E, S11	ADOT	Euro-American/ late historic	Eligible under A	Conduct mitigative documentation
AZ AA:16:377 (ASM)	T17S, R20E, S11	ADOT	Euro-American/ late historic	Non contributing	None
AZ BB:16:48 (ASM) Crossing 6	T17S, R20E, S11	Private	Euro-American/ late historic	contributing under A	None
AZ EE:3:212 (ASM)*	T17S, R20E, S3	City of Benson	Archaic, Hohokam	unevaluated	Conduct eligibility testing, followed by data recovery, if necessary; monitor
AZ EE:3:213 (ASM)*	T17S, R20E, S4	Private	Euro-American/ middle to late historic	Not eligible	None

Table 3.11-9. Archaeological Sites in Segment C: NRHP Eligibility and Treatment Recommendations

Site No.	Location	Land Status	Cultural/ Temporal Affiliation	Eligibility	Recommended Treatment
AZ Z:2:40 (ASM) Crossing 7	T17S, R20E, S5	Private	Euro-American/ late historic	contributing under A	None
AZ EE:3:215 (ASM)*	T17S, R19E, S6	Private	Euro-American/ middle to late historic	Eligible under A, C	Conduct mitigative documentation
AZ AA:12:875 (ASM) Crossing 1	T17S, R18E, S2	ASLD	Euro-American/ late historic	contributing under A	None
AZ EE:3:214 (ASM)*	T17S, R19E, S3	ASLD	Euro-American/ late historic	Eligible under D	None
AZ Z:2:40 (ASM) Crossing 8	T17S, R19E, S4	Private	Euro-American/ late historic	Non-contributing	None
AZ EE:2:327 (ASM)	T17S, R18E, S5	ASLD	Archaic	unevaluated	Conduct eligibility testing, followed by data recovery, if necessary; monitor
AZ EE:2:51 (ASM)	T17S, R17E, S1	ASLD	Archaic, Hohokam	Eligible under D	Conduct phased data recovery; monitor
AZ FF:9:17 (ASM) Crossing 1	T17S, R17E, S1	County	Euro-American/ late historic	contributing under D	None
AZ EE:2:44 (ASM)	T17S, R17E, S1	ASLD	Hohokam	Eligible under D	Use access route with provision that only rubber-tired vehicles be used; monitor
AZ Z:2:40 (ASM) Crossing 9	T17S, R17E, S1	Private	Euro-American/ late historic	Non-contributing	None
AZ EE:2:491 (ASM)	T17S, R17E, S2	ASLD	Archaic	Eligible under D	Conduct phased data recovery; monitor

Table 3.11-9. Archaeological Sites in Segment C: NRHP Eligibility and Treatment Recommendations

Site No.	Location	Land Status	Cultural/ Temporal Affiliation	Eligibility	Recommended Treatment
AZ BB:14:673 (ASM)	T16S, R17E, S31	ASLD	Euro-American/ middle historic	Eligible under A	Conduct mitigative documentation
AZ FF:9:17 (ASM) Crossing 2	T16S, R16E, S36	County	Euro-American/ late historic	contributing under D	None
AZ EE:3:74 (ASM) Crossing 1	T16S, R16E, S15	Private	Euro-American/ late historic	contributing under A	None
AZ EE:3:74 (ASM) Crossing 2	T16S, R16E, S16	Private	Euro-American/ late historic	contributing under A	None
AZ BB:14:713 (ASM)*	T16S, R16E, S16	Private	Euro-American/ late historic	Not eligible	None
AZ BB:13:556 (ASM)	T15S, R15E, S27	Private	Euro-American/ late historic	Eligible under D	Conduct mitigative documentation
AZ EE:3:74 (ASM) Crossing 3	T15S, R14E, S3	Private	Euro-American/ late historic	Non-contributing	None
AZ AA:12:875 (ASM) Crossing 2	T14S, R14E, S34	Private	Euro-American/ late historic	Eligible under A	None
Segment C, Alternate 2					
AZ FF:1:34 (ASM)	T16S, R24E, S15	Private	Euro-American/ late historic	Non-contributing	None
AZ CC:3:91 (ASM)	T16S, R24E, S15	ADOT	Euro-American/ late historic	Non-contributing	None
AZ CC:13:54 (ASM)	T16S, R24E, S17	County	Euro-American/ late historic	Not eligible	None
Segment C, Alternate 4					
AZ AA:16:377 (ASM)	T17S, R20E, S12	County	Euro-American/ late historic	Non-contributing	None
AZ EE:3:85 (ASM)	T17S, R20E, S12	Private	Euro-American/ late historic	Not eligible	None
AZ BB:16:48 (ASM)	T17S, R20E, S11	Private	Euro-American/ late historic	contributing under A	None

Table 3.11-9. Archaeological Sites in Segment C: NRHP Eligibility and Treatment Recommendations

Site No.	Location	Land Status	Cultural/ Temporal Affiliation	Eligibility	Recommended Treatment
Segment C, Alternate 5					
AZ AA:12:875 (ASM)	T14S, R14E, S34	Private	Euro-American/ late historic	contributing under A	None
Segment C, Alternate 7					
AZ EE:3:74 (ASM)	T15S, R14E, S3	ADOT	Euro-American/ late historic	contributing under A	Conduct mitigative documentation
AZ BB:13:578 (ASM)	T15S, R14E, S3	ADOT	Indeterminate	unevaluated	Conduct eligibility testing, followed by data recovery, if necessary; monitor
AZ AA:12:875 (ASM)	T14S, R14E, 34	County	Euro-American/ late historic	contributing under A	None
Non-Site Occurrences					
AZ CC:15:78		private	Mogollon/ indeterminate	Eligible under D	Avoid using access route, or conduct phased data recovery and monitor
AZ CC:14:26		private	Euro-American/ late historic	Not eligible	None
AZ BB:16:66		private	Euro-American/ late historic	Not eligible	None
AZ BB:16:40		private	Mogollon/ 1000-1150	Eligible under D	Avoid using access route, or conduct phased data recovery and monitor
AZ EE:2:44		ASLD	Hohokam/ pre-Classic, Classic	Determined Eligible under D	Use access route with provision that only rubber-tired vehicles be used; monitor
AZ T:14:61		NPS	Euro-American/ middle historic	Contributing under A	To be determined by consultation

Table 3.11-9. Archaeological Sites in Segment C: NRHP Eligibility and Treatment Recommendations

Site No.	Location	Land Status	Cultural/ Temporal Affiliation	Eligibility	Recommended Treatment
AZ EE:3:74		UP	Euro-American/ late historic	Contributing under A	None
AZ Z:2:40		UP	Euro-American/ middle to late historic	Contributing under A	None
AZ BB:16:48		EPNG easement	Euro-American/ late historic	Determined eligible under A	None
AZ CC:15:77		private	Euro-American/ middle historic	Not eligible	None
AZ BB:16:37		Cochise County	Euro-American/ late historic	Not eligible	None
AZ BB:16:38		Cochise County	Euro-American/ late historic	Not eligible	None
AZ BB:16:39		Cochise County	Euro-American/ late historic	Not eligible	None
AZ AA:12:875		EPNG easement	Euro-American/ late historic	Determined eligible under A	None
AZ BB:14:673		ASLD	Euro-American/ middle historic	Eligible under A	Conduct mitigative documentation

3.11.5 Ancillary Facilities

All facilities are included in the affected environment section for each segment.

3.11.6 Environmental Consequences

3.11.6.1 Proposed Action

The cultural resource survey recorded 111 sites. Sixty sites are recommended eligible to the NRHP. Tables 3.11-3, 3.11-6, and 3.11-9 provide avoidance options for each segment location. Of the 60 eligible sites, there are 8 sites in Texas (Segments A and B), 9 sites in New Mexico (Segment B), and 43 sites in Arizona (Segment C). Most of these sites consist of artifact scatter with features. The cultural affiliation most encountered in eligible sites is within the Archaic, Mogollon and Hohokam. When avoidance is not possible, data recovery in accordance with the approved treatment plan is recommended for each eligible site. Data

recovery would be limited to the portion of the site within the ROW. Section 106 consultation is ongoing and would be completed before issuance of the Notice to Proceed and ROW grant.

If prehistoric or historic cultural remains, features, and/or human remains are encountered during the construction of the proposed pipeline, the contractor is advised to cease all work and notify BLM and other pertinent agencies.

Five ditch crossings were recorded in Texas. All are abandoned. All are recommended not eligible to the NRHP. No further treatment is recommended. The IOs were recorded and have no additional data potential. No further treatment is recommended.

3.11.6.2 No Action Alternative

Under the No Action Alternative, no ground disturbing activities would occur for the proposed project areas. The No Action Alternative would have no immediate affect on any undiscovered resources, historic or cultural, that might be present. No mitigation would be required. However, continued aging of the existing pipeline could lead to increased maintenance activities that could impact cultural resources not previously impacted. Such activities could be in emergency situations that could lead to unforeseen impacts to cultural resources.

3.12 Visual Resources

The assessment of the visual impacts is based upon the degree of change in the existing visual character from the perspective of the roads and cities along the route. Visual resources include the following landscape components:

- Land forms
- Water features
- Vegetation types
- Land use
- Cultural modifications

From the perspective of the motorist along I-10, most of the pipeline route would be in the background, especially where the pipeline is hidden from the line of sight by the berm of the railroad track. From the perspective of the people living in cities along the route, the route would conform to the visual effects created by the existing pipeline. In areas where the route deviates from the existing pipeline, minimizing the removal of trees and shrubs would help to minimize the potential visual impact.

3.12.1 Affected Environment

3.12.1.1 Segment A

Segment A follows existing pipeline corridors currently occupied by SFPP pipelines.

3.12.1.2 Segment B

The proposed pipeline follows existing pipelines corridors currently occupied by SFPP and El Paso Natural Gas pipelines. This route passes through 5.5 miles of the Organ and Franklin ACEC. The Utility Corridor is a VRM Class III area and the surrounding ACEC is a Class II area.

3.12.1.3 Segment C

The majority of this segment follows existing SFPP pipeline corridors and is adjacent to the I-10 corridor and/or the UPRR corridor. The eastern portion of the segment follows the existing SFPP ROW through open desert from Apache Pass to Benson, Arizona. The proposed pipeline would pass within one mile north of the Bowie Mountain Scenic Area of Critical Environmental Concern. The area is located along the southern boundary of the Fort Bowie National Historic Site. Public land within this view shed is designated and managed as a Visual Resource Management, Class I area. Class I management objective is to preserve the existing character of the landscape. This class provides for natural ecological changes; it does not, however, preclude very limited management activity.

3.12.1.4 Ancillary Facilities

The breakout facility, pump stations, and terminals already exist and would undergo upgrades. New pipeline markers would be installed along the entire route as required by 49 CFR 195.410. Cathodic protection test stations also would be installed (bolted/welded) onto the pipeline every mile according to regulations.

3.12.2 Environmental Consequences

3.12.2.1 Proposed Action

Short-term visual impacts during construction are expected due to ground disturbance; short-term contrasts in form, line, color, and texture; and increased traffic, especially of construction vehicles. After the line has been installed and covered within the ACEC of Segment B, topsoil would be spread over the disturbed areas and reseeded. Rocks and brush piles will then be scattered over the seeded areas to improve seeding, discourage OHV use and erosion, and present a more natural appearance.

Long-term visual impacts are not expected as a result of the proposed route since the pipeline would be installed underground within existing pipeline corridors.

New ancillary facilities such as the cathodic protection test stations and pipeline markers would create a visual mark. However, these facilities are necessary for the protection of the pipeline and safety of the surrounding environment.

3.12.2.2 No Action Alternative

Under the No Action Alternative, no pipeline expansion would occur and no ancillary facilities such as cathodic protection test stations and pipeline markers would be installed. The No Action Alternative would not alter the landscape from the present condition and would therefore not affect the current visual quality along any of the four segments of the proposed pipeline expansion. No mitigation would be required.

3.13 Noise

This section presents the potential effects of noise from the construction and operation of the project on the surrounding area.

3.13.1 Fundamentals of Acoustics

Noise is defined as unwanted sound. Airborne sound is a rapid fluctuation of air pressure above and below atmospheric pressure. There are several different ways to measure noise, depending on the source of the noise, the receiver, and the reason for the noise measurement. In this subsection, some statistical noise levels are stated in terms of decibels on the A-weighted scale (dBA). Noise levels stated in terms of dBA reflect the response of the human ear by filtering out some of the noise in the low and high frequency ranges that the ear does not detect well. The A-weighted scale is used in most ordinances and standards. The equivalent sound pressure level (L_{eq}) is defined as the average noise level, on an energy basis, for a stated period of time (for example, hourly). In practice, the level of a sound source is conveniently measured using a sound level meter that includes an electrical filter corresponding to the A-weighted curve. The sound level meter also performs the calculations required to determine the L_{eq} for the measurement period.

Technical noise terms used in this report are summarized in Table 3.13-1.

TABLE 3.13-1
Definitions of Acoustical Terms

Term	Definitions
Decibel (dB)	A unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the measured pressure to the reference pressure, which is 20 micropascals (20 micronewtons per square meter).
A-Weighted Sound Level, dB	The sound pressure level in decibels as measured on a sound level meter using the A-weighted filter network. The A-weighted filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise. All sound levels in this report are A-weighted.
Equivalent Noise Level, L_{eq}	The energy average noise level during the measurement period.
Percentile Noise Level (L_n)	The noise level exceeded during n percent of the measurement period, where n is a number between 0 and 100 (e.g., L_{10} is the noise level exceeded 10 percent of the time).
Day-Night Noise Level (L_{dn} or DNL)	The average A-weighted noise level during a 24-hour day, obtained after the addition of 10 decibels to the noise levels from 10:00 p.m. to 7:00 a.m.
Ambient Noise Level	The composite of noise from all sources near and far. The normal or existing level of environmental noise at a given location.
Intrusive	Noise that intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency, and time of occurrence and tonal or informational content as well as the prevailing ambient noise level.

The effects of noise on people can be listed in three general categories:

- Subjective effects of annoyance, nuisance, or dissatisfaction
- Interference with activities such as speech, sleep, or learning
- Physiological effects such as startling and hearing loss

In most cases, environmental noise produces effects in the first two categories only. However, workers in industrial plants may experience noise effects in the last category. No completely satisfactory method exists to measure the subjective effects of noise, or to measure the corresponding reactions of annoyance and dissatisfaction. This lack of standard is primarily because of the wide variation in individual thresholds of annoyance and habituation to noise.

Table 3.13-2 shows the relative A-weighted noise levels of common sounds measured in the environment and in industry for various sound levels.

TABLE 3.13-2
Typical Sound Levels Measured in the Environment and Industry

Noise Source At a Given Distance	A-Weighted Sound Level in Decibels	Noise Environments	Subjective Impression
	140		
Civil Defense Siren (100 ft)	130		
Jet Takeoff (200 ft)	120		Pain Threshold
	110	Rock Music Concert	
Pile Driver (50 ft)	100		Very Loud
Ambulance Siren (100 ft)			
	90	Boiler Room	
Freight Cars (50 ft)		Printing Press Plant	
Pneumatic Drill (50 ft)	80	Kitchen With Garbage Disposal Running	
Freeway (100 ft)			
	70		Moderately Loud
Vacuum Cleaner (10 ft)	60	Data Processing Center	
Department Store			
Light Traffic (100 ft)	50	Private Business Office	
Large Transformer (200 ft)			
	40		Quiet
Soft Whisper (5 ft)	30	Quiet Bedroom	
	20	Recording Studio	
	10		Hearing Threshold

3.13.2 Affected Environment

The project would be designed and constructed in a manner that ensures compliance with federal, state, county and city laws and regulations.

Although there are no federal noise limits, guidelines are available from the USEPA (1974) to assist state and local government entities in development of state and local regulations for noise. The Federal Energy Regulatory Commission (FERC) has adopted these guidelines in their *Guidance Manual for Environmental Report Preparation* (August 2002) that states that the project must demonstrate that it "will comply with applicable noise regulations" and "must not exceed a day-night sound level (L_{dn}) of 55 dBA at any pre-existing noise-sensitive area." A L_{dn} of 55 dBA is equivalent to a continuous level of L_{eq} 49 dBA. It should be noted that the FERC manual was developed to provide guidance for natural gas projects, which have the potential to be very loud. FERC guidelines are not directly applicable to product pipelines such as the project discussed in this document.

Onsite noise levels are regulated, in a sense, through the OSHA. The noise exposure level of workers is regulated at 90 dBA, over an 8-hour work shift to protect hearing (29 CFR 1910.95). Onsite noise levels are anticipated to be in the 70- to 85-dBA range. Areas above 85 dBA would be posted as high noise level areas and hearing protection would be required.

The pipeline traverses through Texas, New Mexico and Arizona, none of which have regulations that limit industrial noise. What follows is a discussion of the local noise regulations that were determined applicable to this project. In the absence of local regulations, the project would be designed to comply with FERC guideline of 55 dBA L_{dn} (49 dBA L_{eq}) at existing noise-sensitive areas.

3.13.2.1 Segment A

Segment A is located within the County of El Paso, Texas and Fort Bliss as shown in Figure 2.1-1. The noise regulations for El Paso are detailed in Chapter 9.40 of Title 9, Health and Safety, of the municipal code. The most restrictive limit to residential areas is 50 dBA between the hours 10:00 p.m. and 7:00 a.m. Noise sources associated with construction are exempt provided that they are not active between the hours of 8:00 p.m. and 7:00 a.m. on weekdays and Saturday or any time on Sunday or a holiday and do not exceed 65 dBA.

3.13.2.2 Segment B

Segment B is located in El Paso County, Texas and Dona Ana County, New Mexico as shown in Figure 2.1-2. Dona Ana County has no regulations that limit noise levels.

3.13.2.3 Segment C

Segment C passes through Cochise and Pima counties, Arizona as shown in Figure 2.1.-3. Neither Cochise nor Pima County has a noise ordinance. The Sheriff's Department is tasked with dealing with nuisance noise in Pinal County.

3.13.2.4 Ancillary Facilities

The Tucson Terminal is in an industrial area located near Davis-Monthan Air Force Base (DMAFB). The most restrictive noise limit in residential areas is 62 dBA between the hours of 10:00 p.m. and 7:00 a.m. (Chapter 16.31, Tucson City Municipal Code). Construction activities conducted between sunrise and 8:00 p.m. Mondays through Saturdays (except legal holidays) is exempt from regulation.

The breakout station is located in the El Paso. The applicable regulations are summarized in above for Segment A.

The Deming pump station is located in the City of Deming, New Mexico. Title 4 Chapter 2 of the City's Municipal Code establishes comprehensive noise limits, including frequency dependent criteria (refer to Table 3.13-3). Construction noise limits of 75, 80, and 85 dBA (L_{10}) are established for residential/institutional, business/recreational and industrial uses respectively. The limit applies at 50 feet from the construction equipment or the lot line, whichever is furthest.

TABLE 3.13-3
Noise Limits for the City of Deming, New Mexico

Octave Band Center Frequency (Hz)	Residential (7 a.m. to 6 p.m.)	Residential (6 p.m. to 7 a.m.)	Commercial (7 a.m. to 6 p.m.)	Commercial (6 p.m. to 7 a.m.)	Industrial (6 p.m. to 7 a.m.)	Industrial (7 a.m. to 6 p.m.)
31.5	76	68	79	72	79	83
63	75	67	78	71	78	82
125	69	61	73	65	73	77
250	62	52	68	57	68	73
500	56	46	62	51	62	67
1000	50	40	56	45	56	61
2000	45	33	51	39	51	57
4000	40	28	47	34	47	53
8000	38	26	44	32	44	50
Single Number Equivalent (dBA)	60	50	65	55	65	70

Source: Title 4, Chapter 2, City of Deming, New Mexico Municipal Code (http://66.113.138.216/sterlingcodifiers/NM/Deming/index.htm)

3.13.3 Environmental Consequences

3.13.3.1 Proposed Action

Construction Noise. Construction of the project is expected to start May 2007. The noise level would vary during the construction period, depending on the construction phase and number and location of operating construction equipment. Individual equipment noise levels typically used on similar heavy construction projects are presented in Table 3.13-4.

TABLE 3.13-4
Equipment Noise Levels on Heavy Construction Projects (dBA)

		Equipment type	Range in Noise Level at 50 ft
Equipment Powered by Internal Combustion Engines	Earth Moving	Front Loaders	72-84
		Backhoes	72-93
		Tractors	77-96
		Scrapers	80-93
		Graders	80-93
		Pavers	86-89
		Trucks	82-94
	Materials Handling	Concrete Mixers	75-88
		Concrete Pumps	81-84
		Cranes, Movable	75-88
		Cranes, Derrick	86-89
	Stationary	Pumps	68-72
		Generators	71-82
		Compressors	74-87
Impact Equipment		Mounted Breakers (Hoerams)	76-94
		Pneumatic Wrenches	82-89
		Jackhammers & Rock Drills	81-98
		Impact Drivers (Peak)	95-106
Other		Vibrator	69-81
		Saws	72-82

Source: Oregon Department of Transportation Noise Manual

Operational Noise. Noise sources associated with this project primarily include electrically driven pumps and valves. All pumps and valves are anticipated to comply with an 85 dBA at 3 feet specification. In general, the noise generated from this project is expected to be similar to the noise generated by the existing pipeline. There have been no noise complaints from the existing pipeline.

Segment A of the pipeline is located within a corridor that is currently used by multiple SFPP pipelines. The El Paso pump station would be modified but no pump upgrade would be required. The existing El Paso Breakout facility would receive two new 2,000 hp pumps, 16" pig launcher, control valve, surge pump and upgrades to existing pumps. Power line upgrades may also be required. Therefore, the noise level associated with this segment is anticipated to be similar to existing levels.

Segment B of the pipeline follows an existing pipeline from the El Paso Breakout facility to Afton Station. The noise level associated with this segment is anticipated to be similar to existing levels. The Deming pump station would receive a pump and control valve

upgrade. The new 3,500 hp shipping pump is anticipated to be similar in noise level to the existing pumps and to comply with the 85 dBA at 3 feet specification.

Segment C of the pipeline follows existing pipeline corridors as well as the I-10 and/or UPRR corridor. Therefore, the noise level associated with this segment is anticipated to be similar to existing levels.

The existing pumps at the Tucson Terminal would receive a new 16" pig receiver and inbound piping, control valve, relief valves, meter & prover, jet fuel filters, distribution manifold & sub manifolds and upsized tank lines. The outbound system will be upgraded by installing: a new 3,000 HP shipping pump and motor and new control valve. Given the industrial uses surrounding the Tucson Terminal and DMAFB to the east, the noise level associated with the new pumps is not anticipated to increase noise levels.

3.13.3.2 No Action Alternative

Under the No Action Alternative, no pipeline expansion would occur and no pump or breakout stations would be constructed. The Phoenix/Tucson region would continue to receive a large portion of their petroleum products via tanker truck. The potential environmental impacts, including noise, associated with hauling petroleum products by tanker truck would remain.

3.14 Environmental Justice

This section was prepared in compliance with Presidential Executive Order (EO) 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* (EO 12898), dated February 11, 1994, and Title VI of the Civil Rights Act of 1964. The purpose of this section is to determine if the proposed project would have disproportionately high and adverse human health or environmental effects on minority and/or low-income populations. This analysis focuses on the populations located within the area potentially affected by the proposed project. In accordance with EO 12898, this analysis documents minority and low-income populations within El Paso County in Texas; Doña Ana County in New Mexico; and Cochise and Pima Counties in Arizona. In addition, this analysis also documents minority and low-income populations within the cities/communities of El Paso, Anthony, Vado, Vail, Benson, and Tucson. After establishing the existence of minority and low-income populations within the study area, this section evaluates if there are disproportionately high and adverse impacts on these populations once all of the mitigation measures for the significant impacts have been implemented. This analysis also examines where the high and adverse impacts (as reported in the various environmental analysis sections of this EA) fall relative to these populations.

EO 12898, issued by President Clinton in 1994, requires that "each federal agency shall make achieving environmental justice (EJ) part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations…". In his memorandum transmitting EO 12898 to federal agencies, President Clinton further specified that, "each federal agency shall analyze the environmental effects, including human health, economic and social effects, of federal actions, including effects on minority communities and low-income communities, when such analysis is required by the

National Environmental Policy Act of 1969." Guidance on how to implement EO 12898 and conduct an EJ analysis has been issued by the President's Council on Environmental Quality(CEQ) (CEQ, 1997).

Title VI of the Civil Rights Act of 1964 states that "No person in the United States shall, on the ground of race, color, or national origin be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving federal financial assistance." Title VI bars intentional discrimination, but also unjustified disparate impact discrimination resulting from policies and practices that are neutral on their face (i.e., there is no evidence of intentional discrimination) but have the effect of discrimination on protected groups.

3.14.1 Affected Environment

Both EO 12898 and Title VI address persons belonging to the following target populations:

- Minority – all people of the following origins: Black, Asian, American Indian and Alaskan Native, Native Hawaiian or Other Pacific Islander, and Hispanic
- Low income – persons whose household income is at or below the U.S. Department of Health and Human Services poverty guidelines.

The U.S. Census Bureau provided a definition of minority and low-income populations. The term "minority population" includes persons who identify themselves as African American, Asian or Pacific Islander, American Indian or Alaskan Native, or Hispanic. Race refers to census respondents' self-identification of racial background. Hispanic origin refers to ethnicity and language, not race, and may include persons whose heritage is Puerto Rican, Cuban, Mexican, or Central or South American. Low-income populations were identified as populations that are below the poverty line (as established by the U.S. Department of Health and Human Services poverty guidelines). The U.S. Census Bureau does not provide a specific definition for "low income." Rather, the term is used interchangeably with "poverty" (USEPA, 2000). For this analysis, low-income populations were identified using the Census Bureau's ratio of income in 1999 to poverty level. Individuals whose income to poverty ratios are below 1 are considered low income.

The proportion of low income, minority, and Hispanic populations was calculated for each of the counties and cities/communities to determine whether the project would cause a "disproportionately high and adverse" impact to either minority or low-income populations. The following sections present data on minority, Hispanic, and low-income populations by segment.

3.14.1.1 Segment A

The majority of Segment A is located on private lands within the City of El Paso. The other portion of the segment is within Fort Bliss Military Reservation adjacent to the City of El Paso, Texas. As the numbers in Table 3.13-1 show, the population of the City of El Paso is predominantly Hispanic (76.7 percent of the total population). However, most of the Hispanic population in the city also is white (74.1 percent of the total population). About 22 percent of the population in the City of El Paso is low income (Table 3.13-2).

TABLE 3.14-1
Segment A, Racial and Ethnic Distribution of Population, 2000 Census

Area	Population	White	Black	Amer. Indian	Asian	Hawaiian	Other[a]	Hispanic[b]
El Paso County	679,622	74.1%	3.0%	0.7%	1.0%	0.1%	21.0%	78.3%
El Paso City	564,280	73.5%	3.1%	0.7%	1.2%	0.1%	21.4%	76.7%
Rest of County	115,342	76.9%	2.8%	0.6%	0.3%	0.0%	19.3%	86.2%
State of Texas	5,130,632	75.5%	3.0%	4.9%	1.8%	0.1%	14.7%	25.2%

[a] Other includes the "Two or more races" category.

[b] Hispanic origin refers to ethnicity and language, not race, and may include persons whose heritage is Puerto Rican, Cuban, Mexican, or Central or South American.

Source: U.S. Department of Commerce (DOC), 2004.

TABLE 3.14-2
Segment A, Distribution of Low-Income Population, 2000 Census

Area	Population for Whom Poverty Is Determined	Low-Income Population	Percent Low-Income Population
El Paso County	666,676	158,722	23.8%
El Paso City	558,932	124,281	22.2%
Rest of County	107,744	34,441	32.0%
State of Texas	20,287,300	3,117,609	15.4%

Source: USDOC, 2004.

3.14.1.2 Segment B

Segment B would pass through both El Paso County, Texas and Dona Ana County, New Mexico. In New Mexico, the communities of Anthony and Vado are the only populous areas near the proposed ROW. All of the communities and counties in this segment have a white population that comprises more than 50 percent. As Table 3.13-3 shows, this segment is characterized by high Hispanic populations. Both of El Paso and Dona Ana County are predominately white—El Paso County is 74.1 percent White and Dona Ana County is 67.9 percent White. The table also shows the racial/ethnic distribution for the state of New Mexico.

As shown in Table 3.13-4, the low-income populations within the New Mexico portion of this segment range from 34 percent (in the community of Vado, NM) to a low of 32.7 percent (in Anthony, NM). For comparison purposes, the table also shows the distribution of low-income population throughout the state of New Mexico.

TABLE 3.14-3
Segment B, Racial and Ethnic Distribution of Population, 2000 Census

Area	Population	White	Black	Amer. Indian	Asian	Hawaiian	Other[a]	Hispanic[b]
Dona Ana County, NM	174,682	67.9%	1.4%	1.4%	0.8%	0.1%	28.4%	63.4%
Anthony CDP[c]	7,904	57.8%	0.3%	0.9%	0.2%	0.1%	37.8%	96.4%
Vado CDP[c]	3,065	51.2%	1.3%	1.0%	0.0%	0.0%	46.4%	97.7%
Rest of County	163,713	68.4%	1.4%	1.5%	0.8%	0.1%	27.9%	62.6%
State of New Mexico	1,819,046	66.8%	1.8%	9.5%	1.0%	0.1%	20.8%	42.1%

[a] Other includes the "Two or more races" category.
[b] Hispanic origin refers to ethnicity and language, not race, and may include persons whose heritage is Puerto Rican, Cuban, Mexican, or Central or South American.
[c] CDP = Census Designated Place

Source: USDOC, 2004.

TABLE 3.14-4
Segment B, Distribution of Low-Income Population, 2000 Census

Area	Population for Whom Poverty Is Determined	Low-Income Population	Percent Low-Income Population
Dona Ana County, NM	169,559	43,054	25.4%
Anthony CDP[a], NM	2,947	1,529	32.7%
Vado CDP[a], NM	3,065	1,041	34.0%
Rest of County	163,547	40,484	24.8%
State of New Mexico	1,783,907	328,933	18.4%

[a] CDP = Census Designated Place

Source: USDOC, 2004.

3.14.1.3 Segment C

Segment C is located entirely in Cochise and Pima counties, Arizona. The community of Vail and the Cities of Benson and Tucson are populated areas that are close to the pipeline route. According to the 2000 Census, the populations of both counties are predominantly White (76.5 percent for Cochise and 75 percent for Pima). Cochise County has less than 50 percent Hispanic population. Hispanics account for 29 percent of Pima County. Table 3.14-5 shows the racial and ethnic distribution of the populations in Segment C.

As shown in Table 3.14-6, the low-income populations within this segment range from 18.4 percent in Tucson to a low of 6.3 percent in Vail. For comparison purposes, the table also shows the distribution of low-income population throughout the state of Arizona.

TABLE 3.14-5
Segment C, Racial and Ethnic Distribution of Population, 2000 Census

Area	Population	White	Black	Amer. Indian	Asian	Hawaiian	Other[a]	Hispanic[b]
Cochise County, AZ	117,755	76.5%	4.3%	1.3%	1.7%	0.2%	15.9%	30.7%
Benson City	4,711	89.3%	0.7%	1.3%	0.5%	0.1%	5.7%	19.8%
Pima County, AZ	843,746	75.0%	2.9%	3.3%	2.0%	0.1%	16.7%	29.4%
Vail CDP[c]	2,484	87.2%	0.6%	0.5%	0.5%	0.0%	7.4%	16.6%
Tucson City	486,699	70.2%	4.3%	2.3%	2.5%	0.2%	16.8%	35.7%
Rest of County	354,563	74.9%	2.9%	3.3%	2.0%	0.1%	16.8%	29.6%
State of Arizona	20,851,820	71.0%	11.4%	0.5%	2.7%	0.1%	14.3%	32.0%

[a] Other includes the "Two or more races" category.
[b] Hispanic origin refers to ethnicity and language, not race, and may include persons whose heritage is Puerto Rican, Cuban, Mexican, or Central or South American.
[c] CDP = Census Designated Place
Source: USDOC, 2004.

Table 3.14-6 shows the distribution of low-income population in Segment C.

TABLE 3.14-6
Segment C, Distribution of Low-Income Population, 2000 Census

Area	Population for Whom Poverty Is Determined	Low-Income Population	Percent Low-Income Population
Cochise County, AZ	111,867	19,772	17.7%
Benson City	4,069	644	13.7%
Pima County, AZ	823,638	120,778	14.7%
Vail CDP[a]	1,572	136	6.3%
Tucson City	379,464	86,532	18.4%
Rest of County	442,602	34,110	7.7%
State of Arizona	5,021,238	698,669	13.9%

[a] CDP = Census Designated Place

Source: USDOC, 2004.

3.14.1.4 Ancillary Facilities

There would be no new ancillary facilities installed near any residential areas. The breakout facility in Segment A is located in an open area next to an industrial building. The Tucson terminal is located in an industrial area of Tucson. Any proposed scraper or pump stations would be located along the ROW well away from any populous areas.

3.14.2 Environmental Consequences

The EJ impacts were evaluated with regard to the minority, Hispanic, and low-income populations within each segment. Definitions of minority and low-income areas were established on the basis of the CEQ's *Environmental Justice Guidance Under the Environmental Policy Act* of December 10, 1997. CEQ's *Guidance* states that "minority populations should be identified where either (a) the minority population of the affected area exceeds 50 percent or (b) the population percentage of the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographical analysis." The CEQ further adds that "The selection of the appropriate unit of geographical analysis may be a governing body's jurisdiction, a neighborhood, a census tract, or other similar unit that is chosen so as not to artificially dilute or inflate the affected minority population."

The CEQ guidelines do not specifically state the percentage considered meaningful in the case of low-income populations. For this study, the assumptions set forth in the CEQ guidelines for identifying and evaluating impacts on minority populations are used to identify and evaluate impacts on low-income populations.

Potential EJ impacts are assumed to occur in an area if the percentage of minority, Hispanic, and low-income populations is meaningfully greater than the percentage of minority, Hispanic, and low-income populations in the general population. For the following analysis, potential EJ impacts are assumed to occur if the percentage of minority, Hispanic, and low-income population within the counties is at least 10 percentage points greater than that of the general population in the state. Similarly, potential EJ impacts are assumed to occur if the percentage of the EJ population in the cities/communities is at least 10 percentage points greater than that of the respective counties.

3.14.2.1 Proposed Action

Segment A. No EJ issues have been identified in direct relation to implementation of the Proposed Action within Segment A. The proportion of minority, Hispanic, and low-income populations within both the City of El Paso and the El Paso County is less than 10 percentage points greater than those of the El Paso County and the State of Texas, respectively.

Segment B. The portion of Segment B in New Mexico has proportions of minority, Hispanic, and low-income populations that are at least 10 percentage points greater than those observed at the county or state level. For instance, the proportion of minority population in the community Vado (49 percent) is significantly higher than that for Dona Ana County (32 percent). Similarly, the proportion of Hispanics in the cities/communities of Anthony and Vado is larger than those of Dona Ana County (see

Table 3-14.3) while the proportion of Hispanics in Dona Ana County is significantly larger than those in the State of New Mexico. Dona Ana County has a percentage of low-income population (25.4 percent) that is larger than that of the state of New Mexico (18.4 percent). Thus, there is the potential for EJ issues with the implementation of the Proposed Action within Segment B. However, the proposed project would replace two existing pipelines along existing ROWs and construction activities in populated areas would be completed quickly and cause minimal disturbances. As such, the Proposed Action would have no disproportionately high and adverse human health or environmental effects on minority, Hispanic, and/or low-income populations.

Segment C. Segment C has proportions of minority, Hispanic, and low-income populations that are at least 10 percentage points greater than those observed at the county or state level. The City of Tucson has minority, Hispanic, and low-income populations that are significantly higher than those observed for Pima County. Thus, there is the potential for EJ issues with the implementation of the Proposed Action within Segment C. However, the proposed project would replace two existing pipelines along existing ROWs and construction activities in populated areas would be completed quickly and cause minimal disturbances. As such, the Proposed Action would have no disproportionately high and adverse human health or environmental effects on minority, Hispanic, and/or low-income populations.

Conclusion. Resource areas with potential for high and adverse human health or environmental impacts that have been evaluated in this study are: air quality, hydrology and water quality, and noise. Resource authors indicate that all impacts would be mitigated to below significance levels. Additionally, the proposed project would follow existing ROWs and construction activities in populated areas would be completed quickly and cause minimal disturbances. As such, the Proposed Action would have no disproportionately high and adverse human health or environmental effects on minority, Hispanic, and/or low-income populations.

3.14.2.2 No Action Alternative

Under the No Action Alternative, no pipeline expansion would occur with the proposed project areas. Health and environmental conditions in any minority, Hispanic, and/or low-income communities would remain unchanged from current conditions. The No Action Alternative would have no disproportionately high and adverse human health or environmental effects to low-income populations.

3.15 Socioeconomics

For the purposes of the EA process, socioeconomic conditions include the short-term socioeconomic effects of the project during construction. The long-term socioeconomic effects consider, at the population or community level, the following:

- The quality of life or "way of life"
- The economy, commercial opportunities, or employment
- The availability of recreational opportunities or amenities
- Home life or personal security

- Future land uses
- Impacts to minority and low-income groups

3.15.1 Short-Term Socioeconomic Impacts

Construction of the proposed project would represent a sizeable total investment in material and labor expenditures in each of the states and individual counties where pipeline segments are constructed. Preliminary estimates of costs are shown below in Tables 3.15-1 to 3.15-3.

TABLE 3.15-1
Costs Per County

Material Per County	Labor Per County	County	State
$3,318,208	$7,732,448	El Paso	Texas
$2,934,047	$977,419	El Paso	El Paso Station and Breakout Facility
$4,810,139	$6,738,053	Dona Ana	New Mexico
$1,741,844	$818,429	Luna	Deming Booster Station
$100,000	$175,000	Hidalgo	Road Forks Delivery
$11,424,189	$15,291,122	Cochise	Arizona
$5,926,969	$7,933,168	Pima	Arizona
$6,165,375	$16,952,699		Tucson Terminal
$36,420,771	$56,618,338		

TABLE 3.15-2
Costs Per State

Material	Labor	State
$6,252,255	$8,709,867	Texas
$6,651,983	$7,731,482	New Mexico
$23,516,533	$40,176,989	Arizona
$36,420,771	$56,618,338	

TABLE 3.15-3
Costs Per Segment

Segment	Material	Labor
Segment A	$2,169,227	$6,122,953
Segment B	$5,959,120	$8,347,548
Segment C	$17,351,158	$23,224,290
	$25,479,505	$37,694,791

The project would employ specialized outside and some local labor in each segment during the construction phase. This would generate additional employment and local spending during this period of time. The amount of local and outside labor used for constructing each segment is not known at this time, but specialized non-local personnel are usually employed for such projects. A sector-by-sector economic "multiplier" analysis, such as the U.S. Bureau of Economic Analysis' Regional Input-Output Multipliers (RIMS), has not been performed at this time, but the overall impacts to employment and aggregate personal incomes in each of the states and specific counties where construction occurs would be positive and is assumed to be higher during the pipeline construction period. The typical direct-effect construction sector employment multiplier has been estimated by past studies in Arizona using RIMS and the Arizona State University Business Outlook Center to be greater than 2.5 for the State of Arizona. This means that full-time equivalent (FTE) of construction employment is estimated to generate more than 2.5 jobs throughout the economy, per the statewide multipliers for RIMS II.

The construction phase also would generate additional sales and ad valorem taxes, where applicable, income taxes in each of the states where construction occurs. These additional state and local revenues can be considered additional revenues that would not occur in the absence of this project.

Construction of the proposed project also would require purchase of a total of 143 miles of easements currently held by private entities, states, and the federal government at an estimated cost of $4.23 million. It is estimated that purchases would include 14 miles of easements in Segment A; 32 miles in Segment B; and 97 miles in Segment C. Fair market prices are expected to be paid for easements. The overall short-term impact of the construction of the proposed project is expected to be positive due to additions to state and local area incomes, tax revenues, and temporary employment.

Since the funding to build the project comes from private industry resources that would otherwise not be spent in these local area, the employment, earnings, and other impacts are therefore truly 'new' to the local and regional economies.

3.15.2 Long-Term Socioeconomic Impacts

The purpose of the proposed pipeline is to aid the region's municipalities in securing additional petroleum sources for the rapidly growing population. The state of Arizona has one of the fastest population growth rates among the 50 states for the last 50 years. Most of

the growth is within the metropolitan Phoenix and Tucson areas, which is known as the Phoenix-Tucson metropolitan corridor. Approximately 80 percent of Arizona's 5 million people live in the Phoenix-Tucson metropolitan corridor (USGS, 2001). According to a market summary produced by Parkway Properties, Inc., the population growth in Phoenix alone has approximated 95,000 people a year since 1990.

The state uses about 7.3 million gallons (173,000 barrels) of gasoline per day. A little less than 5 million gallons (110,000 barrels) are used in Maricopa County alone. For the foreseeable future, economic stability and growth depends on affordable, reliable, and safe supplies of both energy (fuel and electricity) and water. Arizona is in a delicate position due to the scarcity of water and the lack of crude oil production or gasoline refining in the state. Availability and affordability of gasoline is crucial for all citizens, especially those on fixed incomes and those workers with incomes lower than the national average.

Depending on future gasoline demands in the markets serviced by the pipeline, an increase in gasoline supply may create a more stable, or possibly even lower, price environment for wholesale and retail purchasers of gasoline. The new pipeline also would mitigate impacts to potential, temporary supply disruptions such as the temporary supply reductions seen in Maricopa County in June 2003.

3.15.3 Other Long-Term Impacts

Quality of Life. An increased supply of gasoline to the markets served by the new pipeline may ameliorate annual, cyclical changes to gasoline prices at the wholesale and retail levels. All else equal, a higher supply of gasoline may create an environment of lower gasoline prices, although this cannot be determined or assured in advance due to the uncertainties of future local and national gasoline market conditions. The negative feature of increased gasoline supply may be increased storage requirements and, through lower prices, higher per-capita consumption levels, both of which would require environmental monitoring and potential remediation.

Economy, Commercial Opportunities, and Employment. Since gasoline is one of the key inputs to all U.S. economies, a stable, increased supply at a potentially lower price would act as a reduction in the effective cost of business input costs. This would increase consumption by both consumers and business. To the extent that gasoline is considered more secure and potentially price competitive, business competitiveness would be enhanced. Lower input costs for business would enable a higher level of transactions, which may increase employment levels. A potentially lower price of gasoline would enable more travel to rural areas, which would clearly benefit those regions.

Availability of Recreational Opportunities. An increased supply of gasoline would not have a major impact on recreational opportunities, except that at a potentially lower price per gallon, residents would have an added incentive to travel to state recreational areas that are in rural locations.

Home Life and Personal Security. Increased regional gasoline supplies may not noticeably affect these aspects.

Future Land Uses. New land requirements for gasoline storage facilities may be required. A potentially negative impact of a higher supply (and potentially lower prices for gasoline) is that marginally lower transportation costs could promote suburban sprawl.

Impacts to Minority and Low-Income Groups. A higher supply of gasoline may provide a small benefit to these groups through potentially lower costs for transportation. Negative impacts to these groups have not been identified.

3.16 Cumulative Effects

3.16.1 Proposed Action

Implementation of the Proposed Action, along with past, present, and reasonably foreseeable actions, would have no adverse cumulative effects on the resources described in Section 3. Any effects to resources would occur during construction activities and would therefore be temporary, with the exception of cultural resources. Some unavoidable cultural resources would be permanently impacted and mitigation measures have been recommended to preserve the integrity of those resources. After pipeline installation, the ROW would be allowed to return to a natural state. No disturbances would take place as a result of operating the pipeline once it has been installed. The upgrades and continued operation of ancillary facilities associated with this project would have no adverse effects on resources described in this document.

3.16.2 No Action Alternative

Under the No Action Alternative, replacement of approximately 143 miles of pipeline between El Paso and Phoenix would not occur nor would the installation of any associated ancillary facilities occur. SFPP's East Line would continue to operate in its current state, which would not meet the purpose and needs outlined in Section 1.2.

The SFPP East Line, in its current state, would not be able to meet the increasing demands of the Phoenix/Tucson region. The Phoenix/Tucson region is expected to experience continued rapid growth. To keep up with the increased demand in petroleum products, the use of tanker trucks to haul products would need to increase. This increase in truck traffic poses greater threats to people and the environment and would result in a less reliable supply of petroleum products.

Pipelines are distinguished as the safest and most economical method of transporting large quantities of petroleum products across great distances. Pipelines have a better safety record than other methods of transporting petroleum products, especially in relation to hauling by trucks. During the period between 1997 and 2000, truck incidents resulted in over 100 times more deaths, over 30 times more injuries, and over 45 times more fires and/or explosions than pipelines (Allegro Energy Consulting, 2003). Over the past 34 years, pipeline incidents (spills or other safety incidents) have seen a decrease of about 60 percent, despite an increase of 42 percent in the amount of petroleum product transported (Allegro Energy Consulting, 2003). The increased truck traffic, resulting from implementation of the No Action Alternative, may potentially have some serious long-term negative effects on the people and environment along the transport route due to the increased risk of accidents.

In addition to the increased risk of accidents, the increased truck traffic would result in higher levels of air pollution throughout the region. Highway vehicle emissions account for the majority of air pollution. Diesel exhaust, which is used by large transportation trucks, ranks among the air pollutants that the USEPA believes to pose the greatest health risk.

The Phoenix/Tucson region is expected to experience continued unprecedented growth, which would place added pressure on municipalities to provide adequate services. With the selection of the No Action Alternative, the current supply of petroleum products would have to satisfy the increasing demands of this growing population. Price increases of petroleum products based on demand/supply interactions would not be alleviated under the No Action Alternative.

Under the No Action Alternative, the use of tanker truckers would continue and ultimately increase to provide adequate petroleum supplies to a rapidly increasing population. Potential environmental impacts associated with hauling petroleum products by tanker trucks would increase as a result. These impacts include air pollution, possible spillage and other traffic accidents during hauling, noise pollution due to truck traffic, and wear on highways and roads caused by repetitive truck passage.

3.17 Mitigation Measures

All mitigation measures or BMPs listed in Section 2 (see Table 2-3.1) would be implemented as part of the Proposed Action to minimize any potential impacts to resources. These BMPs include practices to minimize impacts to soil and water, vegetation, wildlife, air, and the human environment. Practices also would be implemented to minimize the spread of noxious weeds within the project areas. These BMPs would be incorporated in the construction plan as a proactive way of minimizing any potential impacts to the environment as a result of this project.

Mitigation measures have been recommended for the impacts to cultural resources within the project area that cannot be avoided. If subsurface cultural materials are encountered during construction, all work should stop in the vicinity until a qualified archaeologist can assess the significance of the remains. An Emergency Discovery Plan conventional with the Advisory Council on Historic Preservation and accepted by applicable agencies such as the BLM, SHPOs and tribal agencies would be followed.

3.18 Summary of Impacts

Table 3.18-1 summarizes the determination of potential impacts to resources discussed in this EA.

TABLE 3.18-1
Summary of Impacts

Resource	Impact
Land Use	Short-term impacts during construction. No long-term impacts.
Recreation	Short-term impacts during construction. No long-term impacts.
Geology and Soils	Short-term impacts during construction. No long-term impacts.
Hydrology and Water Quality	Potential short-term impacts in the event that groundwater is encountered during excavation. No long-term impacts.
Floodplains and Waters of the United States	Would not affect the function of any waterways.
Biological Resources	
Vegetation	Direct effect to vegetation within the construction ROW but allowed to return to natural state after construction is completed.
Wildlife and Wildlife Habitats	May directly affect individuals by displacing wildlife within the ROW but would not adversely affect species as a whole.
Special Status Species	
Pima pineapple cactus	Would have a direct effect on individuals and potential habitat.
Sand prickly-pear cactus	No direct effects to individuals. May have indirect effect by impacting potential habitat.
Desert tortoise	No direct effect to individuals. May have indirect effect on foraging behavior of individuals potentially roaming in the area during construction.
Texas horned lizard	No direct effect to individuals. May have indirect effect by impacting potential habitat.
Cactus ferruginous pygmy-owl	No effect direct or indirect effect to the species or its habitat.
Western burrowing owl	No direct effect to individuals. May have indirect effects on potential habitat or nearby burrowing owls during construction.
Jaguar	The Proposed Action would have no direct effects on individual jaguars. The Proposed Action may have an indirect effect on foraging behavior of jaguars by displacing prey species during construction.
Lesser long-nosed bat	No direct effect to individuals. May have indirect effect on foraging behavior during construction.

TABLE 3.18-1
Summary of Impacts

Resource	Impact
Cave myotis	No direct effect to individuals. May have indirect effect on foraging behavior during construction.
Fringed myotis	No direct effect to individuals. There are no potential roosts or maternity sites in the project area.
Mexican long-nosed bat	No direct effect to individuals. May have indirect effect on foraging behavior during construction.
Mexican long-tongued bat	No direct effect to individuals. May have indirect effect on foraging behavior during construction.
Western small-footed myotis	No direct effect to individuals. May have indirect effect on foraging behavior during construction.
California leaf-nosed bat	No direct effect to individuals. May have indirect effect on foraging behavior during construction.
Air Quality	Impacts for each segment would be negligible and short-term. Impacts would primarily take the form of fugitive dust during construction activities.
Historic and Cultural Resources	Direct effects to unavoidable cultural resources. Impacts mitigated through data recovery.
Visual Resources	Short-term impacts during construction in the form of construction equipment. No long-term impacts.
Noise	Similar to existing noise levels after construction.
Environmental Justice	No disproportionately high or adverse effects on minority and/or low-income populations.
Socioeconomics	Positive short- and long-term impacts.